10,424

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OFFICIAL GAZETTE

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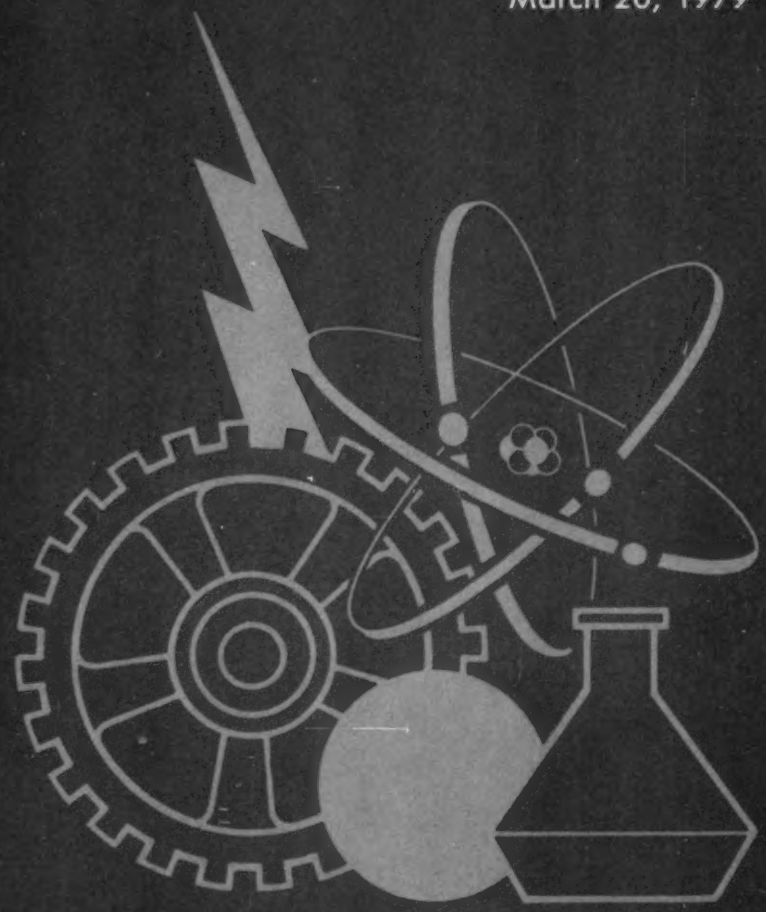
PATENTS

March 20, 1979



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

March 20, 1979 Volume 980 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT): Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of January 1979

Affirmed	209
Affirmed in part	21
Reversed	81
Total	311

Closing of Patent and Trademark Office on Tuesday, February 20, 1979

In view of the fact that Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, were officially closed on February 20, 1979, the Patent and Trademark Office will consider February 20, 1979, a "holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on February 21, 1979. Papers deposited in U.S. Department of Commerce District Offices on February 20, 1979, will similarly be considered timely for the purposes of 35 U.S.C. §§ 119, 133 and 151.

DONALD W. BANNER,
Feb. 21, 1979. *Commissioner of Patents and Trademarks.*

Erratum

The notice of "Reissue Applications Filed" published in the October 31, 1978 Official Gazette erroneously included two applications which are not Reissue applications. The following reference to these applications should be deleted.

4,033,746, Re. S.N. 922,124, Filed July 5, 1978, Cl. 71/30, FOREST FERTILIZATION, Donald C. Young, et al. Owner of Record: Union Oil Co., Los Angeles, Calif., Attorney or Agent: M. Howard Silverstein, et al., Ex. Gr.: 173.

4,035,173, Re. S.N. 922,123, Filed July 5, 1978, Cl. 71/30, SELECTIVELY THINNING AND FERTILIZING TIMBER FORESTS, Saburo Hashimoto, et al., Owner of Record: Union Oil Co., Los Angeles, Calif., Attorney of Agent: M. Howard Silverstein, et al., Ex. Gr.: 173.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,375,352, Re. S.N. 974,624, Filed Dec. 29, 1978, Cl. 364/411, BOWLING SCORER UTILIZING SEMICONDUCTOR ELEMENTS, Robert W. House, et al., Owner of Record: *Brunswick Corporation, Muskegon, Mich.,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 236

3,375,894, Re. S.N. 937,592, Filed Aug. 28, 1978, Cl. 180/128, FLEXIBLE SKIRT COMPONENTS FOR AIR CUSHION VEHICLES, Lavis Albert Henry Riddle, Owner of Record: *Westland Aircraft Limited, Yeovil, Somerset, England,* Attorney or Agent: Roberts B. Larson, et al., Ex. Gp.: 316

3,565,428, Re. S.N. 974,270, Filed Dec. 29, 1978, Cl. 273/54 C, BOWLING SCORE COMPUTER INCLUDING PROGRAMMING MEANS, Eugene E. Reynolds, Owner of Record: *Brunswick Corporation, Skokie, Ill.,* Attorney or Agent: Ernest A. Wegner, Ex. Gp.: 334

3,644,931, Re. S.N. 968,952, Filed Dec. 13, 1978, Cl. 346/74 E, MULTISTYLI RECORDERS WITH STYLI CYCLICALLY MOVED THROUGH INTERSTYLUS SPACING, Philip Roland Stringer, et al., Owner of Record: *Bell & Howell Company, Chicago, Ill.,* Attorney or Agent: Luc P. Benoit, Ex. Gp.: 235

3,829,221, Re. S.N. 971,563, Filed Dec. 20, 1978, Cl. 356/201, APPARATUS FOR AUTOMATICALLY MEASURING THE LIGHT TRANSMISSION FACTOR OR LIQUID TEST SAMPLES, Michel Ossona De Mendez, et al., Owner of Record: *Roussel-Uclaf, Romanville, France,* Attorney or Agent: Leo A. Rosetta, et al., Ex. Gp.: 257

3,961,936, Re. S.N. 001,030, Filed Jan. 2, 1979, Cl. 71/93, HERBICIDAL AGENTS, Kurt Westphal, et al., Owner of Record: *Inventor,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 124

3,989,225, Re. S.N. 968,848, Filed Dec. 12, 1978, Cl. 254/126, VEHICLE LIFTING JACK, Friedrich Keilholz, Owner of Record: *Firma August Bilstein, Ennepetal, Germany,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 323

4,016,043, Re. S.N. 972,411, Filed Dec. 22, 1978, Cl. 195/103.5 R, ENZYMATIC IMMUNOLOGICAL METHOD FOR THE DETERMINATION OF ANTIGENS AND ANTIBODIES, Antonius Hermanus Wilhelmus Maria Schuurs, et al., Owner of Record: *Akzona Incorporated, Asheville, N.C.,* Attorney or Agent: Robert H. Falk, et al., Ex. Gp.: 172

4,027,807, Re. S.N. 954,963, Filed Nov. 20, 1978, Cl. 214/75 R, WHEELCHAIR LIFT, Graham Roy Thorley, Owner of Record: *Transportation Design & Technology, Inc., San Diego, Calif.,* Attorney or Agent: Henri J. A. Charmasson, Ex. Gp.: 314

4,093,466, Re. S.N. 972,088, Filed Dec. 21, 1978, Cl. 106/122, ELECTROLESS TIN AND TIN-LEAD ALLOY PLATING BATHS, Thomas Francis Davis, Owner of Record: *AMP Incorporated, Harrisburg, Pa.,* Attorney or Agent: William J. Keating, et al., Ex. Gp.: 142

4,097,256, Re. S.N. 972,417, Filed Dec. 22, 1978, Cl. 55/429, POWERED CONTAMINANT EVACUATOR, Lewis A. Borsheim, Owner of Record: *C. E. Melroe Industries, Inc., Fargo, N. Dak.,* Attorney or Agent: Leo Gregory, Ex. Gp.: 177

PATENT NOTICES

Certificates of Correction for the Week of March 20, 1979

Re. 29,710	4,095,686	4,108,606	4,121,937
3,808,280	4,095,736	4,108,730	4,121,983
3,978,166	4,096,525	4,108,843	4,122,004
3,990,895	4,096,528	4,108,900	4,122,039
4,002,860	4,097,501	4,108,932	4,123,002
4,002,973	4,097,519	4,109,066	4,123,437
4,003,278	4,098,303	4,109,123	4,124,193
4,005,539	4,099,205	4,109,327	4,124,527
4,014,704	4,100,149	4,109,347	4,124,530
4,025,933	4,100,269	4,109,536	4,124,573
4,044,085	4,100,790	4,109,984	4,124,807
4,057,407	4,100,793	4,110,259	4,125,339
4,062,393	4,101,107	4,110,356	4,125,350
4,062,842	4,101,252	4,111,178	4,125,359
4,068,336	4,101,275	4,111,409	4,125,411
4,071,551	4,101,758	4,112,033	4,125,419
4,071,583	4,101,767	4,112,270	4,125,421
4,072,769	4,102,144	4,112,382	4,125,477
4,073,188	4,102,498	4,112,452	4,125,849
4,074,771	4,103,097	4,113,222	4,126,153
4,080,190	4,103,365	4,113,961	4,126,178
4,080,435	4,103,827	4,113,963	4,126,246
4,080,599	4,103,942	4,113,964	4,127,112
4,082,540	4,104,349	4,113,966	4,127,589
4,083,894	4,104,476	4,114,595	4,127,691
4,084,176	4,104,687	4,114,615	4,127,901
4,084,408	4,105,161	4,114,898	4,128,348
4,085,193	4,105,468	4,115,136	4,128,494
4,086,192	4,105,539	4,115,335	4,128,500
4,086,732	4,105,541	4,115,506	4,128,508
4,087,446	4,105,847	4,115,534	4,128,559
4,087,615	4,105,999	4,116,224	4,128,723
4,088 227	4,106,092	4,116 240	4,128,732
4,089,252	4,106,190	4,116,339	4,128,862
4,089,512	4,106,359	4,117,476	4,129,125
4,092,400	4,106,416	4,118,400	4,129,512
4,092,491	4,106,541	4,118,420	4,129,527
4,092,583	4,106,945	4,119,335	4,129,584
4,092,920	4,106,994	4,119,649	4,129,932
4,092,958	4,107,062	4,119,679	4,130,450
4,093,288	4,107,127	4,119,786	4,130,635
4,093,437	4,108,221	4,119,987	4,130,759
4,094,419	4,108,377	4,120,329	4,131,418
4,094,915	4,108,493	4,120,729	4,131,463
4,095,295	4,108,548	4,121,180	4,132,934

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 921,138. Hermetic Electrical Feedthrough for Aluminum, Filed June 30, 1978.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Services Div., Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent application 929,866. Controlled Release Formulations of Douglas-Fir Beetle Anti Aggregative Pheromone, 3-Methyl-2-Cyclohexane-1-One. Filed July 31, 1978.

Patent application 938,624. Measurement of Water Flow Rate. Filed Aug. 31, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch Westwood Building, Bethesda, Md. 20014

Patent application 902,250. Precision Envelope Detector and Linear Rectifier Circuitry. Filed May 2 ,1978.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18 and C Sts., NW.
Washington, D.C. 20240

Patent application 933,693. Pilot Valve Control Apparatus With Low Frequency Surge Suppression. Filed Aug. 15, 1978.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters NASA—Code GP–2, Washington, D.C. 20546

Patent application 951,829. Microwave Power Transmission Beam Safety System. Filed Oct. 16, 1978.

Patent application 953,314. Method and Tool for Machining a Transverse Slot About a Bore. Filed Oct. 17, 1978.

Patent application 953,390. Noncontacting Method for Measuring Angular Deflection. Filed Oct. 23, 1978.

Patent application 956,161. Ambient Cure Polyimide Foams. Filed Oct. 31, 1978.

Patent application 956,162. Subcutaneous Channeling Probe. Filed Oct. 31, 1978.

Patent application 958,575. Modification of the Electrical and Optical Properties of Polymers. Filed Nov. 7, 1978.

Patent 3,860,946. Space-Charge-Limited Solid-State Triode. Filed Oct. 13, 1972. Patented Jan. 14, 1975. Not available NTIS.

Patent 4,102,580. System for the Measurement of Ultra-Low Stray Light Levels. Filed Dec. 29, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,550. Nozzle Extraction Process and Handlemeter for Measuring Handle. Filed Oct. 19, 1976. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,103,712. Positive Isolation Disconnect. Filed Dec. 15, 1976. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,104,018. Combuster. Filed Nov. 26, 1976. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,104,084. Solar Cells Having Integral Collector Grids. Filed June 6, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,104,091. Application of Semiconductor Diffusants to Solar Cells by Screen Printing. Filed May 20, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,104,134. Method for Making an Aluminum or Copper Substrate Panel for Selective Absorption of Solar Energy. Filed Aug. 31, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,105,261. Spherical Bearing. Filed Oct. 29, 1976. Patented Aug. 8, 1978. Not available NTIS.

Patent 4,105,517. Solar Photolysis of Water. Filed Sept. 30, 1977. Patented Aug. 8, 1978. Not available NTIS.

Patent 4,119,926. Apparatus and Method for Stabilized Phase Detection for Binary Signal Tracking Loops. Filed Dec. 8, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,119,964. Systems and Methods for Determining Radio Frequency Interference. Filed Oct. 28, 1976. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,119,972. Phased Array Antenna Control. Filed Feb. 3, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,121,965. Method of Controlling Defect Orientation in Silicon Crystal Ribbon Growth. Filed July 16, 1976. Patented Oct. 24, 1978. Not available NTIS.

Patent 4,122,214. Solar Cell Collector and Method for Producing Same. Filed Oct. 21, 1977. Patented Oct. 24, 1978. Not available NTIS.

Patent 4,122,833. Non-Tracking Solar Energy Collector System. Filed May 27, 1977. Patented Oct. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Service, Div. Federal Bldg., Agriculture Research Service Hyattsville, Md. 20782

Patent application 898,556. Wet-Wall Electroinertial Air Cleaner. Filed Apr. 21, 1978.

Patent application 945,954. Mechanical Shaker Assembly for Continuous Harvesting of Fruit. Filed Sept. 26, 1978.

U.S. DEPARTMENT OF COMMERCE

National Technical Information Service, Office of Government Inventions and Patents, Springfield, Va. 22161

Patent application 960,193. Apparatus and Method for Galvanic Detection of Optical Absorptions. Filed Nov. 13, 1978.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St., SW., Washington, D.C. 20590

Patent application 963,804. Large Hose Automatic Testing Device. Filed Nov. 27, 1978.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18 and C Sts., NW., Washington, D.C. 20240

Patent application 912,264. Hydrometallurgical Extraction of Tungsten From Refractory Tungsten Ores. Filed June 5, 1978.

Patent application 919,645. Portable Calibrator for D.C. Circuit Breakers. Filed June 27, 1978.

Patent application 923,837. Dewatering of Slimes. Filed July 12, 1978.

Patent application 925,672. Resin for Sorption of Tungsten. Filed July 18, 1978.

Patent application 928,493. Adjustable Spanner Wrench. Filed July 27, 1978.

Patent application 928,494. Face Ventilation System for Coal Mines. Filed July 27, 1978.

Patent application 931,067. Lock-Out Logic Circuit for Inverter Protection. Filed Aug. 4, 1978.

Patent application 931,068. Electrowinning of Metals. Filed Aug. 4, 1978.

Patent application 931,069. Method of and Apparatus for Non-Destructively Testing Concrete. Filed Aug. 4, 1978.

Patent application 934,151. High Efficiency, High Frequency Lighting Inverter. Filed Aug. 16, 1978.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters NASA—Code GP–2, Washington, D.C. 20546

Patent application 877,786. Antiaircraft System and Method Employing Small Projectiles. Filed Feb. 14, 1978.

Patent application 938,299. An Improved Apparatus for Use in the Production of Ribbon-Shaped Crystals From a Silicon Melt. Filed Aug. 31, 1978.

Patent application 938,581. Interferometric Locating System. Filed Aug. 31, 1978.

Patent application 946,995. Stark Cell Spectrophone With Polarization Modulation. Filed Sept. 29, 1978.

Patent application 953,391. Hydrogen Hollow Cathode Ion Source. Filed Oct. 23, 1978.

Patent 4,099,452. Smokestack-Mounted Airfoil. Filed Nov. 10, 1975. Patented Jan. 11, 1978. Not available NTIS.

Patent 4,100,331. Dual Membrane Hollow Fiber Fuel Cell and Method of Operating Same. Filed Feb. 3, 1977. Patented July 11, 1978. Not available NTIS.

Patent 4,100,487. Lightning Current Waveform Measuring System. Filed Mar. 30, 1977. Patented July 11, 1978. Not available NTIS.

Patent 4,101,195. Anastigmatic Three-Mirror Telescope. Filed July 29, 1977. Patented July 18, 1978. Not available NTIS.

Patent 4,101,780. Method of Obtaining Intensified Image From Developed Photographic Films and Plates. Filed June 9, 1976. Patented July 18, 1978. Not available NTIS.

Patent 4,101,891. Surface Roughness Measuring System. Filed Nov. 24, 1976. Patented July 18, 1978. Not available NTIS.

Patent 4,117,731. Pseudo Continuous Wave Instrument. Filed Dec. 8, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,118,701. FM/CW Radar System. Filed Oct. 8, 1976. Patented Oct. 3, 1978. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 24, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-19-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-15-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-23-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-28-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	10-12-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	10-19-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-10-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-14-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-23-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-2-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-18-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	4-28-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-17-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	11-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during February 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 600, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,019,440 to 3,023,411, inclusive
Plant Patents..... Numbers 2,133 to 2,142, inclusive

REISSUES

MARCH 20, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

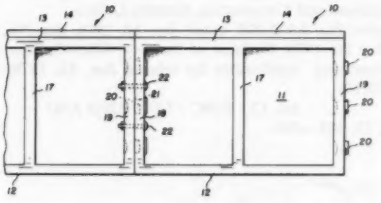
Re. 29,936
SWIMMING POOL WALL

George F. Arp, 27 Terrace Villa, Fairport, N.Y. 14450

Original No. 3,564,791, dated Feb. 23, 1971, Ser. No. 802,849, Feb. 27, 1969. Application for reissue Aug. 19, 1977, Ser. No. 825,955

Int. Cl.[2] E02D *27/00;* E04H *3/16*

U.S. Cl. 52—169.7 7 Claims



1. A swimming pool wall comprising:

(a) a plurality of uniform sections;

(b) means for securing said sections together;

(c) said sections being formed of molded structural foam and comprising:

(1) a vertical, flat, facing wall continuous for the length of said section;

(2) a base formed integrally with said facing wall;

(3) said base extending along the bottom of said facing wall;

(4) said base being perpendicular to said facing wall;

(5) said base extending outwardly from the back of said facing wall;

[(5)] *(6)* a coping wall formed integrally with said facing wall;

[(6)] *(7)* said coping wall extending along the top of said facing wall;

[(7)] *(8)* said coping wall extending outwardly from the back of said facing wall;

(9) said coping wall having a curved portion extending forward of the front face of said facing wall;

[(8)] *(10)* end walls formed integrally with said facing wall, said base, and said coping wall;

[(9)] *(11)* said end walls extending vertically between said base and said coping wall at each end of said section;

[(10)] *(12)* said end walls extending outwardly from the back of said facing wall;

[(11)] *(13)* said end walls of adjacent ones of said sections having mutually abutting surfaces;

[(12)] *(14)* said mutually abutting surfaces having aligned projections and recesses arranged for fitting together to align said adjacent sections;

[(13)] *(15)* a rib between said end walls;

[(14)] *(16)* said rib being formed integrally with the top of said base, the bottom of said coping wall, and the back of said facing wall; and

[(15)] [said coping wall having a curved portion extending forward of the front face of said facing wall.]

(17) said rib extending outwardly from the back of said facing wall.

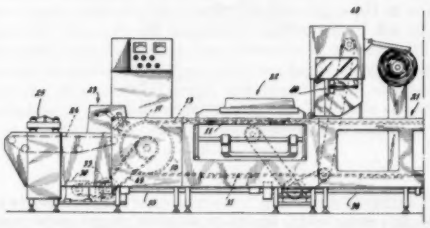
Re. 29,937
CONTINUOUS MOVEMENT PACKAGING MACHINE

Reid A. Mahaffy, Montclair; James C. Kimbaris, Parsippany, and Russell DiDonato, Maplewood, all of N.J., assignors to Mahaffy & Harder Engineering Co., Totowa, N.J.

Original No. 39,583,943, dated May 25, 1976, Ser. No. 442,780, Feb. 15, 1974. Continuation of Ser. No. 217,209, Jan. 12, 1972, Pat. No. 3,958,394. Application for reissue Dec. 29, 1977, Ser. No. 865,719

Int. Cl.[2] B65B *31/02, 47/02*

U.S. Cl. 53—511 32 Claims



31. Apparatus for making sealed packages of the type including a product-supporting component with a cooperating closure component sealed thereto; said apparatus comprising:

means to support a continuous sheet of packaging material and to move it at constant speed along a substantially horizontal path;

first and second packaging modules;

said first module comprising a first pair of horizontally-movable sections carrying a first set of operating means, said first sections being located respectively above and below said path of movement;

said second module comprising a second pair of horizontally-movable sections carrying a second set of operating means, said second sections being located respectively above and below said path of movement at positions downstream of said first module sections;

at least one section of each said pair of sections being arranged to be reciprocated relative to the other section thereof to effect engagement of the corresponding set of operating means with said sheet of packaging material while the pair of module sections move horizontally with the sheet of material;

cyclical drive means comprising means for moving both said pairs of module sections, each pair being moved in one phase of its cycle in said downstream direction and then in the upstream direction in the next phase of its cycle;

said drive means including means for producing said relative reciprocating movement of said pairs of module sections and to effect engagement of said operating means with said sheet of packaging material during a portion of the downstream movement of said module section pairs while said module sections move at the same speed as said packaging material;

said first set of operating means comprising thermoforming means including means to heat the packaging material and to stretch portions thereof so as to produce product-supporting package components;

means located between said first and second modules to supply packaging material over the product-supporting package components formed in said continuous sheet of packaging material to serve as closures arranged to cooperate with the components formed by said first set of operating means so as to define complete packages;

said second set of operating means comprising means to seal

said closures to said product-supporting components to provide sealed packages.

Re. 29,938

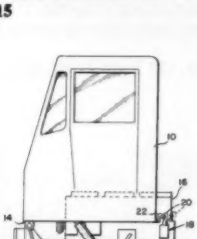
TILT CAB POWER STREAM AND VALVE CONTROL THEREFOR

Dale A. Knutson, Oconomowoc, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Original No. 3,985,194, dated Oct. 12, 1976, Ser. No. 502,220, Aug. 30, 1974. Application for reissue Jul. 6, 1977, Ser. No. 813,234

Int. Cl.² B62D *33/06*

U.S. Cl. 180—89.15 **16 Claims**



15. In a motor vehicle having an elongated chassis, a cab, means pivotally mounting said cab on said chassis about an axis transverse to the longitudinal axis of said chassis, at least one fluid pressure actuated piston and cylinder assembly having one end connected to said chassis and the other end connected to said cab for moving said cab from a normally lowered first position to at least a partially raised second position, said cab by the weight thereof urging said piston and cylinder together when said cab is in said second position, latch means between said chassis and cab to lock said cab in said first position, a hydraulic pump, a fluid reservoir, a first flow control valve, first conduit means connecting said at least one cylinder to said first valve, second conduit means connecting said pump and said reservoir to said first valve, means for driving said pump, said latch means being fluid pressure actuated, third conduit means communicating said latch means to said first conduit means, said latch means being movable from a normally closed position to an open position in response to a predetermined increase in pressure in said first conduit means, a second valve in said third conduit means preventing return flow from said latch means when said cab is in a tilted position and actuator means activated by said cab prior to its reaching said first position to maintain said second valve in an open position.

Re. 29,939

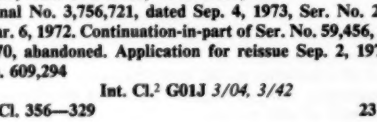
SPECTROMETER SYSTEM

David T. Williams, Gainesville, Fla., assignor to Board of Regents, State of Florida, Tallahassee, Fla.

Original No. 3,756,721, dated Sep. 4, 1973, Ser. No. 232,053, Mar. 6, 1972. Continuation-in-part of Ser. No. 59,456, Jul. 30, 1970, abandoned. Application for reissue Sep. 2, 1975, Ser. No. 609,294

Int. Cl.² G01J *3/04, 3/42*

U.S. Cl. 356—329 **23 Claims**



13. In a spectrometer system including a radiant energy source for producing a focused energy beam, a scanning spectrometer having a single entrance slit for receiving the focused energy beam and a single exit slit for passing the radiant energy beam from said spectrometer, said system including a single photomultiplier detector, an absorption cell adapted to contain a medium to be investigated and receiving the radiant energy beam from said spectrometer, said system having no correlation mask corresponding to a medium to be investigated in said cell, means for sinusoidally varying the wavelength of the radiant energy beam from said source into said spectrometer at a constant and rapid frequency, said sinusoidally varying beam passing from said spectrometer through said absorption cell onto said detector and, means to receive the output signal from said detector and provide an indication of the existence and concentration of the medium to be investigated.

Re. 29,940

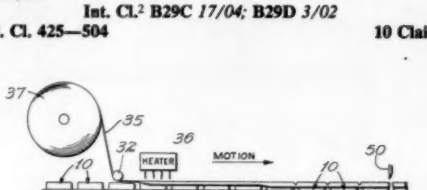
APPARATUS FOR LINING CARTONS

Lawrence H. Knoell, Maiden Rock, Wis., assignor to Champion International Corporation, Stamford, Conn.

Original No. 3,932,105, dated Jan. 13, 1976, Ser. No. 582,291, May 30, 1975. Division of Ser. No. 506,945, Sep. 18, 1974, abandoned. Application for reissue Jan. 13, 1978, Ser. No. 869,159

Int. Cl.² B29C *17/04;* **B29D** *3/02*

U.S. Cl. 425—504 **10 Claims**



6. Apparatus adapted to line a tray having a bottom wall and side walls made from foldable paperboard or similar sheet-like material with a continuous strip of thermoplastic film, comprising:

conveyor means for holding a plurality of said trays;

means for driving said conveyor to advance said trays;

means for dispensing a continuous strip of said thermoplastic film into position above said trays;

means for deforming that portion of the film directly above said tray into contiguous conforming relationship with the inside surfaces of said tray; and

means for separating said tray and contiguous conforming portion of said film from film positioned between adjacent trays and not in contact therewith.

Re. 29,941

METHOD AND APPARATUS FOR SEPARATING GASES

Graham Bird, Papillion, Nebr., assignor to Petrocarbon Developments Ltd., Manchester, England

Original No. 3,944,400, dated Mar. 16, 1976, Ser. No. 565,423, Apr. 7, 1975. Continuation-in-part of Ser. No. 418,027, Nov. 23, 1973, abandoned. Application for reissue Mar. 13, 1978, Ser. No. 885,592

Claims priority, application United Kingdom, Mar. 12, 1974, 11000/74

Int. Cl.² B01D *15/06, 53/04*

U.S. Cl. 55—21 **40 Claims**

1. A method of separating a purified gas from a mixture thereof with at least one gaseous contaminant by pressure swing adsorption, said method comprising the steps of

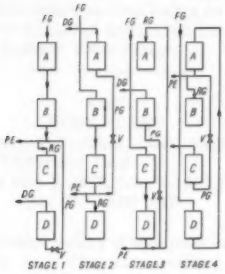
a. providing an adsorption unit comprising x zones of adsorbent material which selectively adsorbs said gaseous contaminant, x being a whole number of at least three;

b. passing the gas mixture at a first pressure through y of the zones of said adsorption unit arranged in series with respect to the flow of the gas mixture therethrough, y being

a whole number of from 2 to x−1 and said y zones constituting a separation section of said adsorption unit;

c. recovering from the last zone of said separation section a purified gas in which the concentration of the contaminant does not exceed a predetermined value which is below the concentration of contaminant in the gas mixture;

d. before the concentration of the contaminant in said purified gas rises above said predetermined value, but after the concentration of said contaminant in the gas stream leaving the zone forming the penultimate zone of said separation section has exceeded said predetermined value, adding another zone of said adsorption unit to the end of said separation section, expressed in terms of the direction of flow of said gas mixture through the separation section whereby said added zone now forms the last zone of said separation section;



e. removing from said separation section the zone forming the first zone of the section whereby the zone next to it in the separation section now becomes the first zone;

f. purging the adsorbent in said removed zone of adsorbed material by passing a purge gas through it at a second pressure which is lower than the first pressure whereby to prepare said zone for re-use in the adsorption section commencing as the last zone of said section; and

g. periodically repeating steps (d), (e) and (f) whereby each zone of said unit is in successive periods incorporated into the separation section as the last zone thereof, subsequently periodically progressed along said section until it becomes the first zone thereof, and then purged ready for re-incorporation into the separation section in a subsequent period.

Re. 29,942

PROCESSING COMPOSITIONS FOR COLOR TRANSFER PROCESSES COMPRISING ALKALI METAL FLUORIDES

David E. Hannie, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,028,103, dated Jun. 7, 1977, Ser. No. 675,661, Apr. 12, 1976. Application for reissue May 1, 1978, Ser. No. 901,969

Int. Cl.[2] **G03C** *7/00, 5/54, 5/30, 1/40*

U.S. Cl. 96—29 D **14 Claims**

13. In a process for producing a photographic transfer image in color from an imagewise-exposed photosensitive element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; said process comprising treating said photosensitive element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers, said alkaline composition having a pH of at least about 11, whereby an imagewise distribution of dye image-providing material is formed as a function of development and at least a portion of it diffuses to a dye image-receiving layer to provide said transfer image, the improvement comprising including in said alkaline processing composition a salt which is an alkali metal fluoride [or an alkali metal oxalate].

Re. 29,943

AMINOMETHANOBENZAZOCINE INTERMEDIATES

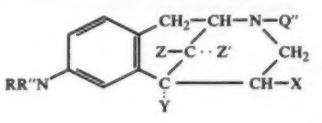
Mark P. Wentland, North Greenbush, and Noel F. Albertson, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Original No. 4,032,529, dated Jun. 28, 1977, Ser. No. 634,355, Nov. 24, 1975. Division of Ser. No. 507,965, Sep. 20, 1974, Pat. No. 3,957,793. Application for reissue Aug. 22, 1977, Ser. No. 826,683

Int. Cl.[2] **C07D** *221/26*

U.S. Cl. 546—97 **12 Claims**

10. 1,2,3,4,5,6-Hexahydro-3-Q''-8RR''N-5X-6-Y-11-Z-11Z'-2,6-methano-3-benzazocine having the formula



wherein:

Q'' is formyl, acetyl or Q* wherein Q* is propionyl, isobutyryl, pivaloyl, acryloyl, 2-methylacryloyl, 2-chloroacrylyoyl, cis-3-chloroacryloyl, cis-3-chlorocrotonoyl, trans-3-chlorocrotonoyl, propiolyl, cyclopropanecarbonyl or 2,2-dichlorocyclopropanecarbonyl;

R is hydrogen or methyl;

R'' is formyl, acetyl, propionyl, butyryl, isobutyryl, benzoyl or cyclopropanecarbonyl;

X is hydrogen, methyl or ethyl;

Y is hydrogen, methyl, ethyl, propyl, allyl or phenyl;

Z is hydrogen, methyl, [ethyl or hydroxy] *or ethyl;* and

Z' is hydrogen, methyl or ethyl.

PLANT PATENTS

GRANTED MARCH 20, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,396

ROSE PLANT

Dorothy J. S. Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed May 5, 1978, Ser. No. 903,382

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by flowers of attractive yellow coloring borne singly on sturdy stems with regularly arranged petals displaying a recurling affect which are long lasting on the plant and as a cut flower and by a plant of upright habit of growth having an abundance of leathery, waxy foliage.

4,397

ROSE PLANT

Dorothy J. S. Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed May 5, 1978, Ser. No. 903,221

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by very large flowers of strong red coloring developing from long pointed buds and borne singly on strong stems and a very vigorous plant with large leathery foliage very resistant to disease and very winter hardy.

4,398

PEACH TREE

Grant Merrill, deceased, late of Red Bluff, Calif., and by Lucile B. Merrill, executrix, 325 Breese Ave., Red Bluff, Calif. 96080

Filed Mar. 20, 1978, Ser. No. 888,692

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, particularly characterized by freestone fruit which—in particular comparison with the Autumn Gem—is similar in size and skin color but is in harvest approximately two weeks later.

4,399

PEACH TREE

Grant Merrill, deceased, late of Red Bluff, Calif., and by Lucille B. Merrill, executrix, 325 Breese Ave., Red Bluff, Calif. 96080

Filed Mar. 20, 1978, Ser. No. 890,577

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, particularly characterized by its fruit being similar in shape to the July Lady, but having close resemblance in skin and flesh color, and in firmness of the flesh, to the Early O'Henry; the harvest period of the present variety being between said July Lady and Early O'Henry.

PATENTS

GRANTED MAR. 20, 1979

ERRATA

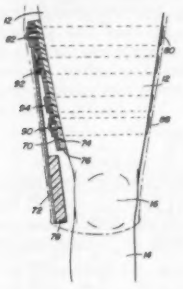
For CLASS	See PATENT NO.
339–075 M	4,144,648
057–058.91	4,144,707
074–230.01	4,144,755
297–159	4,144,823
128–484	4,144,912
414–736	4,144,975
414–042	4,144,976
414–057	4,144,977
414–544	4,144,978
414–537	4,144,979
414–725	4,144,980
414–607	4,144,981
414–666	4,144,982
269–069	4,145,006
267–121	4,145,019
270–052.5	4,145,035
422–232	4,145,187
521–112	4,145,318
528–189	4,145,334
528–302	4,145,335
546–208	4,145,347
546–283	4,145,348
548–320	4,145,547
337–407	4,145,654
357–68	4,145,707
357–82	4,145,708
365–006	4,145,750

PATENTS

GRANTED MARCH 20, 1979

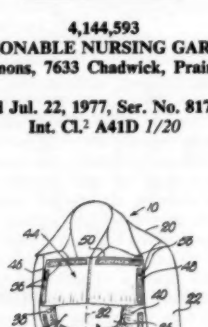
GENERAL AND MECHANICAL

4,144,592
KNEE GUARD
Clinton F. Larson, 569 Sagewood Ave., Provo, Utah 84601
Filed Feb. 24, 1978, Ser. No. 881,643
Int. Cl.[2] A41D *13/06*
U.S. Cl. 2—22 **15 Claims**



1. A knee guard for protecting a person's knee against lateral deflection relative to his hip and foot, said guard including a pair of elongated upstanding inner and outer stiff, but slightly flexible members, means rigidly securing the upper ends of said members together, said members being at least slightly downwardly divergent and said outer member including a lower end portion projecting below the lower end of said inner member, said guard defining means for securing said guard to the thigh of a person with said inner member extending along and abutted against one side of said thigh and said outer member disposed on the side of said inner member remote from said thigh and said lower end portion horizontally registered with and spaced outwardly of said knee and said lower end of said inner portion spaced above said knee, the side of said outer member opposing said inner member including padding means supported therefrom spaced below said lower end of said inner member.

4,144,593
FASHIONABLE NURSING GARMENT
Suzanne D. Timmons, 7633 Chadwick, Prairie Village, Kans. 66208
Filed Jul. 22, 1977, Ser. No. 817,978
Int. Cl.[2] A41D *1/20*
U.S. Cl. 2—104 **9 Claims**



1. A nursing garment comprising:
a bodice having a frontpiece and a backpiece joined together along marginal extremities thereof in a manner for receiving the upper portion of a woman's body generally from her neck to her waist,
said frontpiece having a medial, normally generally vertically extending axis;
said frontpiece further having opening means therein disposed symmetrically with respect to said axis and including an open area on each of the two opposite sides of said axis and through which the woman's breasts may project;
a single panel common to said two areas and covering the same in outwardly disposed relationship to said frontpiece for shielding the breasts from public view,
said panel extending transversely of said axis and in opposite directions therefrom across the frontpiece and terminating in a pair of laterally extreme side edges beyond said areas,
said panel having a lower edge disposed below said areas and interconnecting said two side edges;
attaching means hingedly suspending said panel from the bodice for swinging movement of said lower edge and said side edges of the panel outwardly away from said frontpiece a sufficient distance to provide access to the breasts for nursing without substantially exposing the same; and
selectively releasable fastening means for holding said panel in said covering relationship against said outward swinging movement,
said frontpiece having a pair of laterally spaced side stretches separated by said opening means and overlapped by said panel, said frontpiece further having a transverse stretch interconnecting said side stretches below said opening means,
said bodice further including means defining a pair of armholes, said side edges of the panel having portions thereof disposed below and at least as far rearwardly from said axis as said armholes when the panel is held in said covering relationship by said fastening means.

4,144,594
FILIGREED BELT AND METHOD OF MAKING SAME
Melvin H. Chapman, P.O. Box 57, Nocona, Tex. 76255
Filed Mar. 28, 1978, Ser. No. 891,139
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—338 **18 Claims**

1. A method of decorating a leather product with predetermined indicia, said method comprising the steps of:
forming a pocket at a predetermined portion of the rear of said product by attaching a liner thereto;
marking said indicia on the front of the leather product in an area thereon over said pocket which is to be decorated;
inserting a cutting strip into said pocket between said leather product and said liner thereby forming a cutting surface for preventing damage to said leather product; and
filigreeing said area which is to be decorated by removing material between each of said indicia formed in said marking step.

13. A belt decorated with predetermined indicia through the steps of:
forming a pocket at a predetermined portion of the rear of said belt by attaching a liner to said predetermined rear portion, the length of said liner substantially equal to the length of that portion of the belt which is to be decorated;
marking said indicia on the front of said belt in an area thereon over said pocket which is to be decorated;
inserting a cutting strip into said pocket between said belt and said liner to form a cutting surface for preventing damage to said belt; and
filigreeing said area which is to be decorated by removing

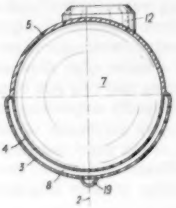
material between each of said indicia formed in said marking step.

4,144,595

ARTIFICIAL HEART CHAMBER

Felix Unger, Mohsgasse 4, Vienna 3, Austria

Filed Nov. 18, 1976, Ser. No. 743,069
Claims priority, application Austria, Nov. 27, 1975, 9044/75
Int. Cl.[2] A61F *1/24;* A61M *1/03*
U.S. Cl. 3—1.7 **5 Claims**



1. An artificial heart assembly comprising: a nondeformable housing;

valve means in said housing for admitting and ejecting blood to and from said artificial heart assembly;

diaphragm means mounted in said assembly for movement through an operating cycle between an end diastolic position and an end systolic position to pump blood to and from said artificial heart assembly; and

fluid pressure means for continuously actuating said diaphragm through said operating cycle;

said diaphragm being structurally joined with said housing to form together with a part of said housing an inner wall surface defining within said artificial heart assembly a blood chamber within which blood is received and from which blood is emitted during actuation of said diaphragm through said operating cycle, said diaphragm and said part of said housing being arranged to define said inner wall surface in the form of an ellipsoid that is continuously concavely smooth throughout when said diaphragm is in said end diastolic position.

4,144,596

WATER SUPPLY CONTROL FOR AUTOMATIC HAND WASHING AND DRYING APPARATUS

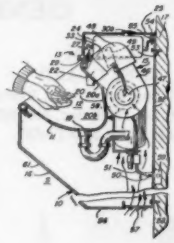
Thomas R. MacFarlane, and Richard G. Sickert, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

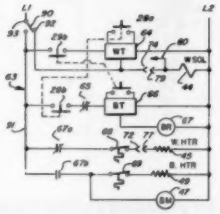
Filed Dec. 30, 1977, Ser. No. 866,173
Int. Cl.[2] A47K *1/04*
U.S. Cl. 4—166 **22 Claims**

1. In a hand washing and drying device having a bowl defining a hand washing and drying space, a water supply including a shutoff valve operated by a water solenoid for delivering hand washing water to said space, and a forced air drying means for delivering hand drying air to said space, an improved control comprising:

first manually operable control means adjacent said space and including a timer means for causing operation of said solenoid for a first preselected short period of time to deliver hand washing water to said space for said preselected period, said timer means being arranged to cause said first period of time to be preselected short period of time to preclude a complete washing and rinsing of the user's hands during one such period thereby requiring a plurality of successive manipulations of the first manually operable means to effect sequentially a plurality of deliveries of hand washing water to effect a complete washing and rinsing of the user's hands; and

second manually operable control means associated with said first control means adjacent said space and including a second timer means for causing operation of said forced air drying means for a second preselected longer period of





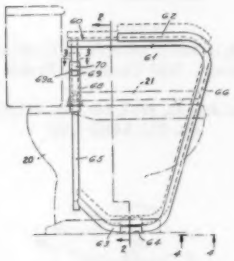
time to deliver hand drying air to said space for said second preselected period.

4,144,597

TOILET SUPPORT

Harold E. Guenther, and Kenneth H. Klein, both of Plymouth, Mich., assignors to C. D. Sparling Company, Plymouth, Mich.

Continuation of Ser. No. 651, 966, Jan. 23, 1976, abandoned, which is a division of Ser. No. 404,933, Oct. 10, 1973, abandoned. This application Aug. 26, 1977, Ser. No. 828,044
Int. Cl.[2] E03D *11/00;* A47C *7/54*
U.S. Cl. 4—254 **1 Claim**



1. In a toilet support for use with a toilet bowl, the combination comprising

a toilet bowl,

a toilet seat pivoted to said toilet bowl about a horizontal axis,

an arm having a hand gripping portion,

said arm having a ground engaging portion,

means mounted on said toilet bowl adjacent said pivotal axis of said toilet seat to said toilet bowl for solely supporting said arm for pivotal movement of said hand engaging portion and said ground engaging portion about a generally vertical axis, said means adjacent said pivotal axis of said toilet seat being operable to hold said arm in a first position wherein said hand engaging portion is in an oper-

ative position adjacent said toilet bowl and said ground engaging portion engages the ground and a second position wherein said hand engaging portion is in an inoperative position away from the toilet bowl and the ground engaging portion is elevated and supported solely by said mounting means out of contact with the ground, wherein said means for supporting said arm comprises a first generally vertical portion forming a part of said arm, a second generally vertical portion telescopically receiving said first portion and mounted on said toilet bowl,

said second portion having a cut away portion defining a vertical slot,

said first portion having a vertical projection thereon,

said projection extending into said slot when said arm is in operative position and said ground engaging portion contacts the ground, said projection engaging the upper end of said second portion when said arm is in inoperative position thereby holding said ground engaging portion out of contact with the ground.

4,144,598

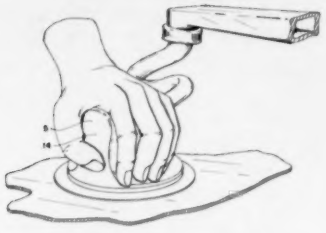
DRAIN CLEARING DEVICE

Steven S. Li, 113A Division St., New York, N.Y. 10002

Filed Jun. 27, 1978, Ser. No. 872,789

Int. Cl.[2] E03D *1/11*; E03C *1/306*

U.S. Cl. 4—256 **1 Claim**



1. A drain clearing device, comprising

a semi-spherical drain-blocking member of soft rubber adapted to fit in a drain opening, said drain-blocking member having a substantially planar top and a diametrical duct extending centrally therethrough at right angles to the top and having an internally threaded part adjacent said top; and

a plunger and water supply device comprising a plunger pipe having spaced opposite first and second ends, the first end having an externally threaded part threadedly coupled to the duct of the drain-blocking member and extending upwardly therefrom, a plunger member coaxially movably mounted in the plunger pipe for movement in axial directions and extending upwardly from the second end of the plunger pipe for manual operation, a return spring around the plunger member at the end thereof outside the plunger pipe for urging said plunger member out of said plunger pipe and a water supply pipe extending from the plunger pipe and having an externally threaded free end for coupling to a water hose, said the lower portion of the plunger member 9 being hollow and open to permit water from said water pipe to reach said duct, plunger and water supply device further comprising a housing plastic having a top, a flat bottom in contact with the planar top of the drain blocking member, sides, a hole formed through the top for accommodating the plunger pipe, a hole formed through the bottom for accommodating the plunger pipe and a hole formed through a side for accommodating the water supply pipe, the sides of the housing having indentations formed therein; and a plunger knob connected to said plunger member with said return spring mounted between the housing and said knob, and wherein said housing sides curve downwardly from the top to conform to the hand of a user whereby upon grasping of the drain clearing device the palm of the hand of the user will engage the knob of the plunger member.

4,144,599

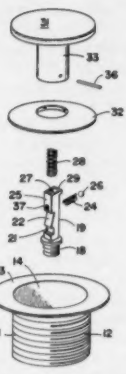
POP UP DRAIN FITTING

Casper Cuschera, 1047 77th Ave., Oakland, Calif. 94621

Continuation-in-part of Ser. No. 773,138, Feb. 28, 1977, Pat. No. 4,103,372. This application Mar. 20, 1978, Ser. No. 888,494

Int. Cl.[2] A47K *1/14*; E03C *1/26*

U.S. Cl. 4—287 **5 Claims**



1. In a drain valve including a drain body having a flow channel therethrough and a post extending axially through said flow channel, and a drain sealing cover provided with a tubular portion having a central passage receiving said post for slidable translation thereabout and radial clearance therefrom, detent means in one axially extending surface of said post for selectively securing said post and said tubular portion with said drain sealing cover sealing said flow channel, said detent means being disengagable by rocking said tubular portion about the upper end of said post, the improvement comprising first compression spring means for biasing said drain sealing cover upwardly to clear said flow channel; and resilient means for biasing said tubular portion radially to oppose said rocking disengagement of said detent means, said resilient means including a hole extending radially into said post, the opening of said hole being in opposed relationship to said one axially extending surface, a biasing member disposed in said hole, and second compression spring means for urging said biasing member into impingement with said central passage of said tubular member.

4,144,600

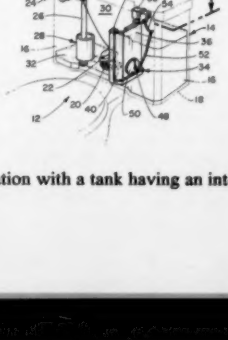
LIQUID VOLUME CONTROL FOR A LIQUID STORAGE TANK

Robert Mayes, 10763 Big Bend Ave., Sunland, Calif. 91040

Filed Dec. 19, 1977, Ser. No. 862,025

Int. Cl.[2] E03D *1/14, 3/12*

U.S. Cl. 4—324 **8 Claims**



1. In combination with a tank having an interior liquid stor-

age chamber, a liquid inlet connected to said tank for supplying liquid into said storage chamber, an outlet located within said tank for exit of liquid from said storage chamber, an outlet valve assembly connected with said outlet, said outlet valve assembly being movable between a closed position preventing exit of liquid from said storage chamber and an open position permitting exit of liquid from said storage chamber, the improvement comprising:

a damming wall located within said tank separately dividing said storage chamber into a first chamber and a second chamber, said damming wall being in snug substantially water-tight contact with the wall surface of said storage chamber but not fixed to said wall surface by any fastening device thereby facilitating location and removal of said damming wall, both said outlet and said inlet connecting with said first chamber, said storage chamber having a pre-established first level for liquid when full and a second level for liquid when empty;

a first opening located within said damming wall intermediate said first level and said second level of liquid but substantially nearer said second level, said first opening connecting with a valve member, said valve member being attached to said damming wall and being formed of thin, flexible sheet material, said valve member being movable between a closed position completely covering said first opening and preventing passage of liquid therethrough and an open position permitting passage of liquid therethrough between said first and second chambers; and

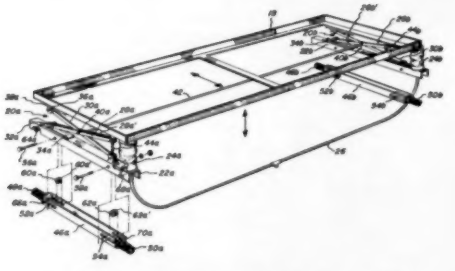
actuation means connected to said valve member, said actuation means movable between a first location and a second location, with said actuation means in said first location the said valve member being in said closed position when liquid within said second chamber is at or near said first level and liquid within said first chamber is at or near said second level, with said actuation means in said first location with liquid in both said first and second chambers at or near said first level the said valve member being located in said open position permitting circulation of liquid between said first and said second chambers, with said actuation means in said second location the said valve member being located in said open position permitting said second chamber to discharge liquid into said first chamber.

4,144,601

AIR RIDE SLEEPER FOR TRUCKS

Alan J. Anderson, 6221 169th La. NW., Anoka, and Anthony R. Hargreaves, 15313 Prairie Rd., Andover, both of Minn. 55303

Filed Feb. 10, 1978, Ser. No. 876,578
Int. Cl.[2] A47C *19/00*; **B62D** *25/00*
U.S. Cl. 5—118 **9 Claims**



1. A human support system for use in a cab of a truck, the system comprising:

a frame for holding a human supporting cushion;

first and second rails adapted to be attached to the truck within the cab;

first and second slides for sliding on the first and second rails;

variable vertical support means connecting the frame and the first and second slides, the variable vertical support means permitting variation in the vertical distance between the frame and the first and second slides and providing horizontal movement of the frame with respect to the cab as the first and second slides slide on the first and second rails, wherein the variable vertical support means comprises first scissor support means connected between the first slide and the frame, and second scissor support means connected between the second slide and the frame, and wherein the first and second scissor support means each comprises:

first and second scissor members pivotally connected to one another at a first pivot point and having their first ends pivotally connected to the frame and to a slide, respectively, and having their second ends slidably engaging the slide and the frame, respectively; and

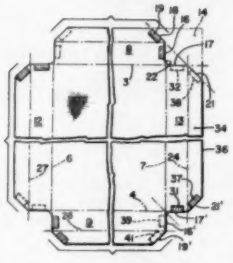
air cushion means connected between the first and second slides and the frame.

4,144,602

FLAT CONTOUR SHEET

Marilyn M. Fernandes, 2952 Sierra Rd., San Jose, Calif. 95132

Filed Dec. 19, 1977, Ser. No. 861,963
Int. Cl.[2] A47C *9/00*
U.S. Cl. 5—334 C **4 Claims**



1. A sheet for use with a mattress having a generally flat area on which a person may repose, said mattress having edge portions of appreciable thickness, said sheet comprising:

(a) a generally flat quadrilateral panel of fabric having a main area dimensioned to correspond to the flat area of the mattress and having marginal edge portions integral with and extending from said main area and defined by end and side edges, each said marginal edge portion having a length measured between said end edges no longer than the corresponding dimension of the associated edge portion of the mattress and having a width measured between the roots of said end edges and said side edge greater than the appreciable thickness of the associated edge portion of the mattress;

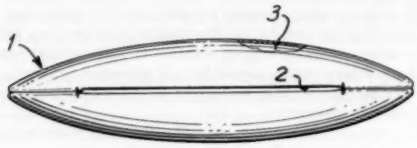
(b) diagonal edges formed at opposite ends of each marginal edge portion of said panel, the diagonal edges of adjacent marginal edge portions at each corner being substantially in alignment whereby no part of said marginal edge portion projects beyond said end and side edges; and

(c) means on said panel associated with said end and diagonal edges on each marginal edge portion for detachably securing together the associated end and diagonal edges of adjacent marginal edge portions when said marginal edge portions are tucked under the mattress to thereby form a contoured corner on said sheet.

4,144,603
METHOD OF RETAINING A PILLOW IN A PILLOW CASE

Alan L. Schaechter, 155 Gibson Blvd., Valley Stream, N.Y. 11581

Filed Jun. 29, 1977, Ser. No. 810,951
Int. Cl.[2] A47G 9/00
U.S. Cl. 5—339 6 Claims

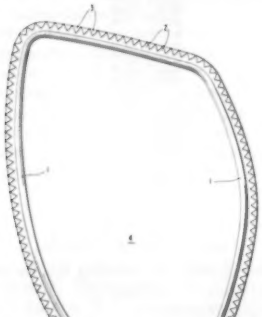


1. A method of retaining a pillow in a pillow case comprising forming a rectangular pillow case which is closed on three sides and has an opening extending along the fourth side, partially closing said fourth side at the edges of the opening to form retainer portions thereat which will contain the pillow in the pillow case, the retainer portions being formed along a prescribed distance in relation to the length of said fourth side to permit insertion of the pillow into the pillow case through said opening when the pillow is inclined thereto while retaining the pillow case when the pillow is thereafter symmetrically oriented in the pillow case, said fourth side being the longer side of the rectangle, said retainer portions constituting between 21 and 37% of the length of said fourth side, said pillow having a length representing about 94% of the length of the fourth side.

4,144,604
LATERAL BOTTOMS FOR HEADRESTS, SEAT CUSHIONS OR THE LIKE IN MOTOR VEHICLES

Willi Fritschi, Sindelfingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,594
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656480
Int. Cl.[2] A47C 7/38
U.S. Cl. 5—360 4 Claims

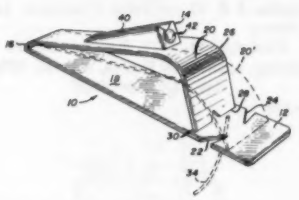


1. A side part for headrests, for seat cushions in motor vehicles or the like, the side part consists of a plastic or textile material and is joined along outer edges with a cording, characterized in that the cording is constructed as an endless ring of an injection molded plastic material, and in that the cording is provided along an outside thereof with tabs of a weldable material which are welded together with the side part.

4,144,605
FISH TACKLE TOOL

Elwood L. Eberhardt, 4281 Norwalk Dr. #108, San Jose, Calif. 95129

Filed Jul. 5, 1977, Ser. No. 812,484
Int. Cl.[2] B25F 1/00
U.S. Cl. 7—106 14 Claims

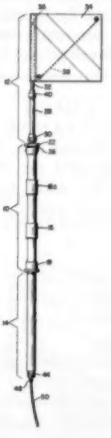


1. A fish tackle tool, comprising:
means forming an elongated base member having at least one slot provided therein for receiving a line to be cut;
means forming an elongated bowed blade member having one end affixed to said base member and the opposite end forming a cutting edge normally engaging a surface of said base member on one side of said slot and sliding along said base member across said slot when a force is applied to a said blade member tending to straighten it out; and
a threading member affixed to said blade member proximate its midpoint and including an upper surface having a longitudinal groove formed therein, and an end surface having a conically shaped recess formed therein such that the axis of said recess angularly intersects the bottom surface of said groove, whereby said recess forms a means for receiving and holding the eyelet of a fishhook and said groove forms a means for guiding a fishline through the eyelet of the hook.

4,144,606
DIVER'S SPAR BUOY AND FLAG

Robert T. McIntyre, 10706 Orchard St., Fairfax, Va. 22030

Filed Mar. 31, 1977, Ser. No. 783,497
Int. Cl.[2] B63C 9/00
U.S. Cl. 9—8 R 8 Claims



1. A collapsible spar buoy comprising as separable components: an upper, flag post assembly; a central storage and floatation section; and a lower, submerged, elongate, weighted base member; said upper assembly, central section and base member being relatively dimensioned in length and diameter whereby said upper assembly and said weighted base member

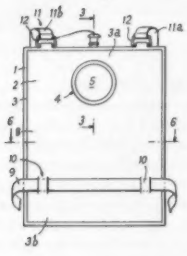
fit entirely within said central section when said spar buoy is collapsed to a storage configuration and sealing means on said central section whereby, with said spar buoy in extended assembly, said central section is sealed substantially air tight to thereby function as a float.

4,144,607

BAG AND FLOTATION BUOY

Pierre J. Soubie, 8 & 10 rue Jules Colombain, La Londe les Maures, France

Filed Apr. 11, 1977, Ser. No. 786,331
Claims priority, application France, Apr. 14, 1976, 76 11781
Int. Cl.[2] B63C *9/08*
U.S. Cl. 9—339 **1 Claim**



1. An insubmersible bag and buoy including body attaching strap means comprising:

(i) a fluid-tight envelope made of flexible sheet material and including in its wall opposed first and second major wall portions, said wall portions being movable towards and away from each other for varying the volume of the envelope, said first wall portion having an opening therein of dimensions adequate to permit at least the hand and forearm to be inserted into the envelope,

(ii) a rigid apertured body engaged in said opening of the first wall portion and sealed in fluid-tight manner to said wall portion,

(iii) a rigid closure removably engaged on said apertured body to close the aperture thereof, and

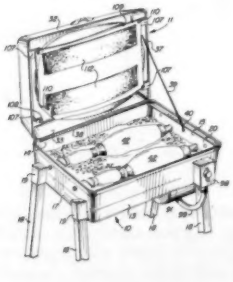
(iv) a conduit passed through said second major wall portion and defining an airflow path between the exterior and the interior of the envelope for inflation of the envelope, said conduit including a non-return valve arranged to permit fluid flow into the envelope and not out of the envelope.

4,144,608

BOWLING PIN CLEANING APPARATUS

Earl W. Daley, 8222 E. Windsor Ave., Scottsdale, Ariz. 85257

Filed Dec. 19, 1977, Ser. No. 861,823
Int. Cl.[2] A63D *5/10*
U.S. Cl. 15—97 R **4 Claims**



1. An apparatus for holding a bowling pin, which pin includes a generally cylindrical body having a contoured surface and normally upper and lower ends, and for holding a quantity of liquid and for cleaning said bowling pin, said apparatus comprising:

(a) a body having a bottom with upstanding front and rear sides and upstanding first and second ends and having an upper peripheral edge,

said bottom, sides and ends forming a liquid retaining vessel;

(b) carriage means carried by said body for supporting said bowling pin and for axially rotating said bowling pin;

(c) drive means for urging rotation of said carriage means;

(d) scrubbing means carried by said apparatus for contacting the surface of said bowling pin and conforming to the contour thereof;

(e) a cover member hingedly affixed to said body and movable between a first position extending over and spaced above said bowling pin supported by said carriage means and a second position in which said bowling pin is removable from said carriage means;

(f) a fluid containing chamber carried by said cover member;

(g) a diaphram forming a wall of said chamber and residing in juxtaposition with said bowling pin when said cover member is in said first position, said diaphram being sufficiently flexible to conform to the contoured surface in response to pressure exerted by said fluid; and

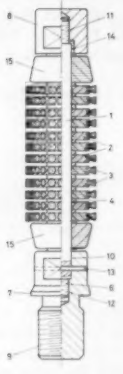
(h) scrubbing pad means extending over said diaphram for contact with the surface of said bowling pin.

4,144,609

BRUSH FOR THE CLEANING OF FIREARM BORES AND GUN BARRELS

Werner Dubs, Erlengutstrasse 8, 8703 Erlenbach, Switzerland

Filed Sep. 23, 1977, Ser. No. 835,891
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646576
Int. Cl.[2] A46B *7/10*
U.S. Cl. 15—104.2 **6 Claims**



1. A gun cleaning brush for cleaning firearm bores containing rifling, comprising in combination:

a central elongate spindle;

a plurality of spaced circular brush unit means adjacent each other mounted freely rotatable on the spindle, each of said brush unit means independently self-adjusting for alignment with the rifling within the bore;

end pieces at each end of the spindle;

transition cones between each of the end pieces and the plurality of brush unit means;

means securing the end pieces to the spindle preventing breakage of the end pieces from the spindle;

one of the end pieces being internally threaded for receiving one end of the spindle which is externally threaded, a

shoulder being formed on the spindle at the external threading, a steel sleeve having a flange being positioned in an enlarged portion of the bore, said one end of the spindle being received through the sleeve such that said shoulder abuts against the flange when said one end piece is tightened;

the other of the end pieces having means for attachment to a polishing rod and also having an axial bore containing an internally threaded portion and a smooth portion, said threaded portion receiving external threads on the other end of the spindle and the smooth portion being in tight fitting relationship with an unthreaded smooth portion of the spindle; and

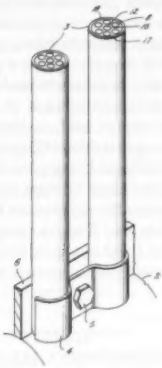
a pin securing said other end of the spindle to the other end piece, said pin passing through the smooth portion of the axial bore and the unthreaded smooth portion of the spindle.

4,144,610

FLEXIBLE BRISTLE

Boyd B. Moore, and Clarence E. Kendall, Jr., both of Houston, Tex., assignors to Custom Cable Company, Houston, Tex.

Filed Apr. 27, 1977, Ser. No. 791,367
Int. Cl.[2] A46D *1/04*
U.S. Cl. 15—159 A **13 Claims**



1. A flexible bristle for use in sweeping comprising:

a length of multistrand wire rope;

a lubricant within the interstices of the wire comprising the strands and core of the rope and within the interstices of the various strands of the rope;

a low melt temperature plastic jacket, high compression extruded onto the exterior and into the intersticial area throughout the length of wire rope; and

a polyurethane jacket extruded onto the exterior of the low melt temperature plastic jacket.

4,144,611

ARTIST'S PAINTBRUSH

Anna P. Brown, 12212 Felton Ave., Hawthorne, Calif. 90250, assignor to Anna P. Brown; Joseph S. Brown, both of Hawthorne and Richard A. R. J. Brown, San Diego, all of, Calif.

Filed Jun. 12, 1978, Ser. No. 914,488
Int. Cl.[2] A46B *9/02*; A46D *1/00*
U.S. Cl. 15—192 **6 Claims**

1. An artist's paintbrush comprising:

a handle;

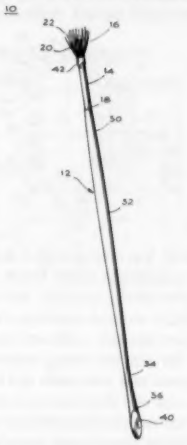
a ferrule having one end secured to said handle; and

a brush portion mounted in the other end of said ferrule and extending outwardly therefrom, said brush portion comprising guard hairs from the tail of a mink which have been separated from the undercoat hair, said brush portion consisting of a larger number of short guard haris and a smaller number of longer guard hairs being capable of painting simultaneously a plurality of fine lines.

6. In the process of preparing a brush portion for an artist's paintbrush, the steps of:

removing hair from the tail of a mink;

brushing the hair of remove the undercoat;



subsequently selecting both short and long guard hairs; and

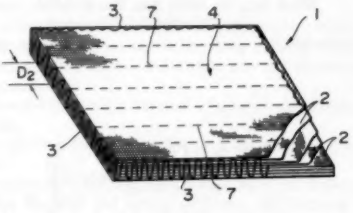
combining the thus selected guard hairs to form a brush portion having a relatively thin surrounding portion formed by the long guard hairs for painting a plurality of fine lines.

4,144,612

CLEANSING AND WIPING CLOTH

Miwako Yamaguchi, 48-5, Honcho 4-Chome, Nakano-ku, Tokyo, Japan

Filed Jun. 9, 1978, Ser. No. 914,095
Int. Cl.[2] A47L *13/16*; B32B *7/08*
U.S. Cl. 15—208 **8 Claims**



1. An improved cloth for cleansing and wiping comprising:

a plurality of stacked, individual layers of fabrics consisting of viscose rayon;

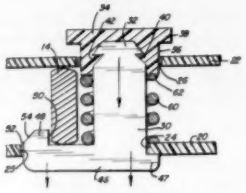
all of said layers of fabrics being substantially of the same size and secured together around common borders thereof, all of said layers of fabrics being stitched together in the area surrounded by said common borders for imparting strength and durability to said cloth, each fabric of said layers being made from a single set of warp yarns interwoven with a single set of filling yarns, interstices between adjacent warp yarns and between adjacent filling yarns being in a range of from 0.5 mm to 2.0 mm, and all of said yarns being entirely of spun rayon.

4,144,613

HOOK-ENDED ARM CONNECTOR

Leo J. Wubbe, Beverly Shores, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Feb. 2, 1977, Ser. No. 764,912
Int. Cl.[2] B60S 1/40
U.S. Cl. 15—250.32 7 Claims



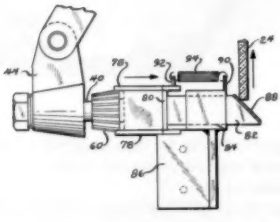
1. A connector for connecting a hook-ended windshield wiper arm to a windshield wiper blade, said wiper blade having a pair of substantially parallel, spaced apart side walls, a pair of substantially aligned openings in said side walls, a pin extending between said side walls and through said openings, a lug carried by the pin and being selectively disposed in the open space between said side walls and being spaced from said pin to trap the hook end therebetween spring means for urging the pin and lug to one selective position so that the lug extends into latching position in said open space between the side walls, and said pin being depressible against said spring means to move the lug to another selective unlatched position removed from the space between the side walls.

4,144,614

WINDSHIELD WIPER DRIVE SYSTEM

Gail G. Barbee, Montgomery, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 26, 1978, Ser. No. 872,536
Int. Cl.[2] B60S 1/22
U.S. Cl. 15—250.34 6 Claims



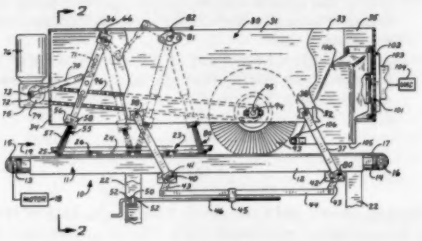
1. In a vehicle cab structure including a cab frame, a window movably mounted on said frame between open and closed positions, a windshield wiper mounted on the cab frame for oscillating wiping movement thereon across the window, a drive for oscillating the wiper and a releasable drive connection between the drive and the wiper, the improvement comprising means responsive to movement of said window from said closed position for releasing said drive connection.

4,144,615

PAN CLEANING APPARATUS

Douglas R. Hanson, 1720 - 9th Ave. South, Anoka, Minn. 55303

Division of Ser. No. 590,404, Jun. 26, 1975, Pat. No. 4,044,420, which is a continuation-in-part of Ser. No. 496,105, Aug. 9, 1974, Pat. No. 3,999,238. This application Jul. 20, 1977, Ser. No. 817,435
Int. Cl.[2] A47L 15/38; B08B 9/08
U.S. Cl. 15—304 8 Claims



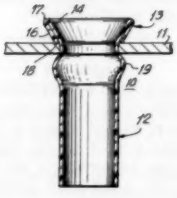
1. A pan cleaning apparatus for cleaning pans comprising a frame, means for moving a pan in a first direction along said frame, a brush, means to mount said brush with respect to said frame in position to engage a pan as a pan is moved with respect to said frame, means to move said brush in a reciprocating path while said brush engages a pan being moved along said frame, a vacuum hood positioned to be superposed over a pan subsequent to the movement of the same pan past said brush, means to support said vacuum hood relative to said frame comprising a pivotable subframe pivotally mounted onto said frame, said subframe being pivotable about a pivot axis to permit said vacuum hood to raise upwardly with respect to pans passing underneath said vacuum hood, and a stop member mounted relative to said frame to stop movement of said subframe and vacuum hood in a direction about said pivot axis of said subframe toward pans underneath said vacuum hood.

4,144,616

WIRE GUIDE BUSHING AND METHOD OF PRODUCTION

Charna Gould, and William Gould, both of Millburn, N.J., assignors to Nyltite Corporation of America, South Plainfield, N.J.

Filed Nov. 10, 1977, Ser. No. 850,144
Int. Cl.[2] B65D 55/00
U.S. Cl. 16—2 6 Claims

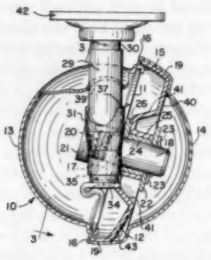


1. A guide bushing device integrally formed of a polymeric resin and including a tubular body of cylindrical configuration along its distal portion and having an outwardly rearwardly flared, funnel shaped proximal end portion, said tubular body being outwardly peripherally bulged to form an outer continuous peripheral ridge of curved transverse cross-section proximate the distal end of said flared proximal end portion.

4,144,617
TILTED AXLE CASTER

Raymond A. McCarroll, Grosse Pointe Woods, Mich., assignor to Herder N.V., Willemstad, Netherlands Antilles

Continuation-in-part of Ser. No. 748,165, Dec. 7, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,427
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—18 A 16 Claims

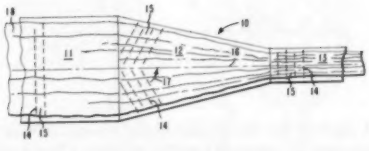


1. A caster comprised of two basic parts including a substantially circular disc-like body frame and a separate wheel rotatable relative to the body frame, said disc-like body frame having a vertical swivel tube socket formed as an integral part of the body frame, a canted axle mounted on said disc-like frame, a thin gauge hollow sheet metal shell enclosing one side of said disc-like body frame and said swivel tube socket, said metal shell extending over the peripheral edge of the disc-like body frame and being crimped over such edge to secure the shell on the body frame, said wheel being rotatably mounted on said axle and having a tread portion overlying said crimped over metal shell at the edge of the disc-like body frame, and a thin gauge hollow sheet metal shell enclosing the open side of said wheel and the axle and secured to a tread portion of the wheel.

4,144,618
MATERIAL CONVERGER

Edgar A. Campo, Circleville, and Robert B. Lewis, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1977, Ser. No. 808,994
Int. Cl.[2] D04H *11/00;* B65H *17/32*
U.S. Cl. 19—161.1 3 Claims



1. A process for converging a moving web of flexible material comprising

applying longitudinal pneumatic force to a wide web of the material to hold the web under tension;

applying balanced transverse pneumatic forces toward the center of the web under tension over a predetermined length of the web to converge the wide web into a roped structure;

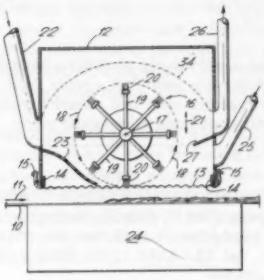
moving the web in the direction of the tension to continually apply longitudinal and transverse forces to the moving web;

whereby the wide web is continually converged to a roped structure.

4,144,619
DRY-LAYING A WEB OF PARTICULATE OR FIBROUS MATERIAL

Derek G. W. White; Nicholas H. Holloway, and Brian W. Attwood, all of Bristol, England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Filed Mar. 15, 1977, Ser. No. 777,856
Claims priority, application United Kingdom, Apr. 2, 1976, 13362/76
Int. Cl.[2] D04H *1/00*
U.S. Cl. 19—304 11 Claims



1. Apparatus for dry-laying particulate or fibrous material entrained in air onto a moving foraminous forming band to form a web thereon, the apparatus comprising,

(A) a fibre distributor,

said fibre distributor comprising a housing and including:

(a) a vibratable planar screen forming a lower wall portion of said housing,

(b) a rotatable brush roll comprising circumferentially spaced brushes arranged for rotation about an axis above and parallel to said screen such that the brushes, when rotating, contact and thereby vibrate the screen,

(c) fibre inlet means for introducing fibre laden carrier air into said housing on one side of said brush roll,

(d) said brush roll being arranged for rotation in a direction such that the brushes are rotated in a path from the fiber inlet means on said one side of said brush, into contact with said screen, and towards the other side of said brush roll whereby the fibre-laden carrier air introduced into said housing through said fibre inlet is moved towards said screen by the rotating brushes,

(e) air inlet means for introducing air into said housing on said other side of said brush roll,

(f) means for introducing air through said air inlet to direct air against fibres moved by said brushes towards said other side of said brush roll to prevent blocking of said screen, and

(g) outlet means for removal of surplus air from said housing;

(B) a moving foraminous forming band below the screen; and

(C) a vacuum box below the forming band for drawing fibres down through the screen and onto the forming band to form a web thereon.

4,144,620
LINE TENSIONING APPARATUS AND METHOD

Daniel M. Schaeffer, 14 Elkin Dr., Middle Island, N.Y. 11953

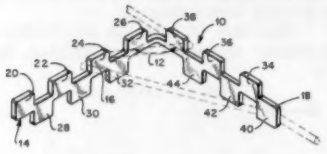
Filed Aug. 17, 1977, Ser. No. 825,180
Int. Cl.[2] A44B *21/00;* B21F *1/02*
U.S. Cl. 24—71.3 11 Claims

4. A line tensioner for releasably tensioning a line, said line strung as may be required, secured at its opposite ends and having an accessible standing part, said line tensioner comprising:

means for engaging a first section of said standing part to generate a first couple in a first sense around an axis, said

means for engaging comprising a plurality of spaced-apart, selectively-engagable engaging members;

and, means, comprising at least a third engaging member, for contacting a second section of said standing part in engagement to selectively generate a second couple exactly counterbalancing said first couple, said third engaging member together with said selectively-engagable engaging members defining a triangular array.



4,144,621

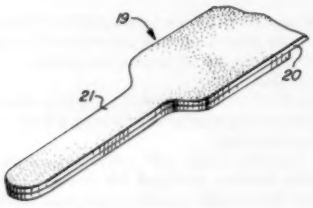
ADJUSTABLE RESILIENT EYELET CLAMP FOR SHOES

Robert L. Green, 2744 N. 60th St., Scottsdale, Ariz. 85257

Filed May 10, 1978, Ser. No. 904,572

Int. Cl.[2] A44B *21/00*; **B44D** *3/18*

U.S. Cl. 24—73 ES **6 Claims**



1. A shoe fastener for extending between cooperating pairs of eyelets comprising:

a flat resilient member, and

a pair of flat metallic members one bonded to cover substantially the width of a common surface of said resilient member at each end thereof,

said metallic members being selectively bendable at points laterally of its end to form a hook for engaging in an eyelet of a shoe,

said resilient member extending along substantially the full length of said metallic members.

4,144,622

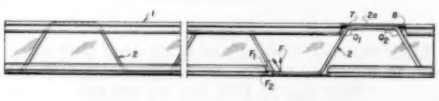
FLEXIBLE-SHEET FIXING DEVICE

Hirota Yoshinari, 773-38 Shimokizaki Oaza, Urawa, Saitama, Japan

Continuation-in-part of Ser. No. 628,124, Nov. 3, 1975, Pat. No. 4,057,095. This application Jul. 15, 1977, Ser. No. 816,179

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—243 K **4 Claims**



1. A sheet fastener for stretching and fixing flexible sheets, said sheet fasterner comprising, in combination, an elongated channel having a substantially flat base and outwardly extending flanges converging toward each other to define, with said base, an outwardly opening groove which has a dovetail shape in cross-section; plural said channels being arranged to be incorporated in a skeleton framework to extend in spaced parallel relation to each other; and an elongated, undulating zig-zag spring resiliently engageable in said dovetail groove adjacent said base, said spring being formed with laterally spaced, longitudinally staggered relatively elongated rectilinear sections interconnected by transversely extending legs with adjacent legs diverging alternately in opposite respective directions; whereby a flexible sheet can be stretched transversely over said channels and into the dovetail grooves thereof and retained in each dovetail groove by insertion of a respective zig-zag spring to hold the sheet, by engagement of said relatively elongated rectilinear sections therewith, in conforming engagement with the interior surfaces of the base and flanges of each channel; the outer edges of said flanges being re-entrantly curled to form a smooth surface for engagement with the flexible sheet; said flanges converging toward each other at respective angles of substantially 45° to said substantially flat base, and having flat and smooth external surfaces; said flanges defining, with said base, curved longitudinal edges of said dovetail groove, said curved longitudinal edges of said dovetail grooves having a radius of curvature of 3mm; the magnitude of undulation of said spring being at least equal to the maximum width of said dovetail groove; each leg joining the associated relatively elongated rectilinear section at a curved juncture therewith; the curved juncture of one leg of each two adjacent legs defining a relatively small angle and the curved juncture of the other leg defining a relatively larger angle.

4,144,623

PROCESS FOR THE PRODUCTION OF TAMPON BLANKS

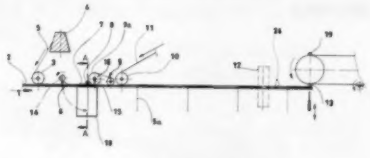
Bert Steffens, Jaugel 5, D-5470 Andernach 13, Fed. Rep. of Germany

Filed Jun. 27, 1977, Ser. No. 810,569

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629381

Int. Cl.[2] A61F *13/20*

U.S. Cl. 28—118 **11 Claims**



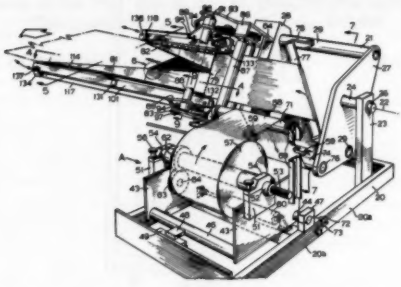
1. A method for the production of a tampon blank particularly adapted for menstral hygiene wherein a fleece made from absorbent cotton or the like is wound up together with a retrieving string arranged on said fleece, said method comprising carrying along a fleece track approximately horizontally by conveying means, supplying a string from a supply roll, placing said supplied string on the fleece track and carrying the string together with the fleece track along in the direction of conveyance, subsequently cutting off the string on the fleece track to form a retrieving string, thereupon pressing one part of the retrieving string onto the fleece track and turning the other part of the retriveing string to a direction transverse to said one part, thereupon tearing off a portion of the fleece track and winding up said torn off fleece track portion together with its retrieving string on a winding pin to form said blank.

4,144,624

MACHINE FOR EXPANDING METAL WEBS

Andrew Szego, and Victor Kallay, both of Toronto, Canada, assignors to Explosafe America Inc., Rexdale, Canada

Filed Aug. 31, 1977, Ser. No. 829,284
Claims priority, application United Kingdom, Sep. 2, 1976, 36391/76; Sep. 2, 1976, 36392/76
Int. Cl.[2] B21D *31/04, 47/02*
U.S. Cl. 29—6.1 18 Claims



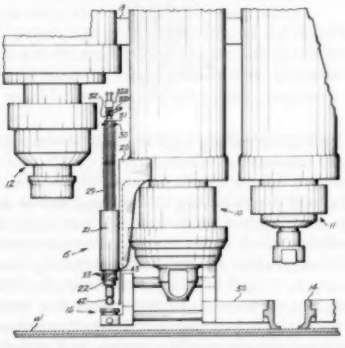
1. A machine for expanding metal webs comprising a pair of expander arms having vertically and horizontally diverging edges for passing a slit metal web therealong for opening the slits in the web out into diamond-shaped meshes, the arms being supported on a sub-frame by adjustable connecting means allowing the angle between the edges of the arms to be widened or diminished, and the sub-frame being mounted on a main frame through second adjustable connecting means allowing the sub-frame to be tilted about a pivotal axis extending longitudinally of the direction of web feed along the arms.

4,144,625

SEALANT APPLICATOR APPARATUS FOR AUTOMATIC RIVETING MACHINES AND THE LIKE

Franciscus Hogenhout, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 21, 1977, Ser. No. 853,413
Int. Cl.[2] B21J *15/10*; B29C *13/00*
U.S. Cl. 29—34 B 15 Claims



1. In liquid sealant applicator apparatus cooperable with an open sealant reservoir means to form and pick up an annular bead of sealant therefrom and to deposit such bead on a workpiece,

elongated pressure-fluid cylinder means having a longitudinally reciprocative piston means therein,

said piston means comprising a rotary pressure-fluid operated motor having a central drive shaft projecting from one end of said cylinder,

said shaft having sealant applicator tip means thereon adapted while being rotated by said motor to be advanced by said piston means into contact with and to be withdrawn from said reservoir means to acquire a bead of sealant therefrom, and alternatively into contact with and retraction from a workpiece so as to deposit said bead of sealant thereon,

pressure-fluid supply means selectively operable to deliver pressure-fluid for selected periods into the end of said cylinder opposite said shaft, thereby to exert advancement force on said piston means and simultaneously rotational drive torque in said motor,

and retraction means operable to exert retraction force on said piston means opposite said advancement force, thereby to effect retraction of the applicator tip from the reservoir means and simultaneously rotational deceleration thereof upon cessation of such delivery of pressure-fluid.

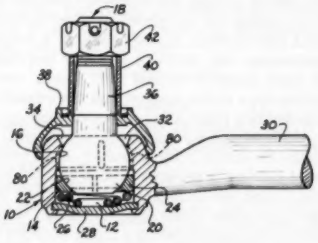
9. The combination defined in claim 1 wherein the apparatus comprises a riveting machine further including drill, countersink and riveting tools operatively mounted together with said pressure-fluid cylinder on a position indexed transfer carriage in predetermined spaced relationship on said carriage and with the operating axes of said tools and said piston means and applicator tip parallel.

4,144,626

METHOD OF FABRICATING FLEXIBLE JOINTS

Victor R. McEowen, 379 Pittsfield Dr., Worthington, Ohio 43085

Continuation-in-part of Ser. No. 663,273, Mar. 3, 1976, Pat. No. 4,064,007. This application May 5, 1977, Ser. No. 793,929
Int. Cl.[2] B21D *53/10*
U.S. Cl. 29—149.5 B 8 Claims



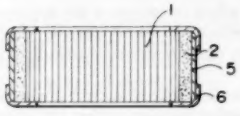
1. The method of making pivot joints comprising in combination, forging an electrically conductive workpiece of carbon steel to form a cup-shaped housing portion including a cavity provided with an inner wall having a bearing wall portion that includes a surface layer of decarbonized metal resulting from said forging machining said bearing wall portion to remove said layer of decarbonized metal and form a finished bearing surface having a carbon content compatible to induction hardening; mounting said workpiece in a locating fixture means including an inductor electrode disposed in said cavity in close proximity to said bearing surface; energizing said electrode to heat in a controlled manner to concentrate the heating effect of said electrode on said bearing surface and thereby harden an annular zone at said bearing surface, the metal in the balance of the housing surrounding said zone remaining non-hardened, tough and fatigue resistant; heading a carbon steel blank to form a ball stud comprising a spherical outer surface including lubricating grooves integrally formed during the heading operation; machining said spherical surface; heat treating said ball stud to case harden said spherical outer surface; surface finishing said ball stud to remove surface film from said spherical outer surface; and mounting said spherical outer surface of said ball stud on said bearing surface of said housing.

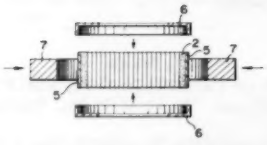
4,144,627

INTEGRATED CATALYST COMPONENT FOR EXHAUST GAS PURIFICATION AND METHOD OF ASSEMBLING IT

Fumiyoshi Noda, and Masahiko Sugiyama, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 17, 1976, Ser. No. 658,394
Claims priority, application Japan, Apr. 10, 1975, 50-43772
Int. Cl.[2] B23P *15/00*; F01N *3/15*
U.S. Cl. 29—157 R 6 Claims





1. Method of assembling an integrated catalyst component for the purification of exhaust gases from an internal combustion engine, which comprises the steps of positioning an elastic ceramic fiber sleeve around the integrated catalyst compressing the sleeve against the integrated catalyst by bringing together around said catalyst the two parts of a longitudinally divided compression ring having a diameter less than the uncompressed outer diameter of said fiber sleeve, and then attaching holding rings to the ends of said compression ring by extending the holding rings axially over the ends of the compression ring to hold said two parts together against said fiber sleeve, whereby by virtue of the elasticity of the ceramic fiber said integrated catalyst is securely held within the frame constituted by said compression ring and holding rings, said step of attaching holding rings comprising attaching holding rings having radially inwardly extending annular portions extending inwardly across opposite ends of the compressed fiber sleeve to protect the sleeve from direct contact of exhaust gases.

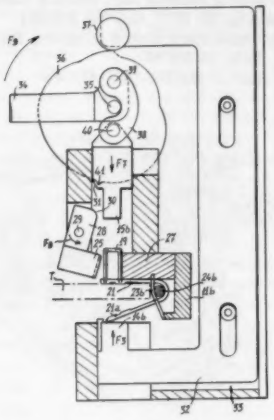
4,144,628

METHOD AND DEVICE FOR FIXING JOINING CLAMPS ON A CONVEYOR BAND, BELT OR THE LIKE

Jean-Francois Schick, 7, rue de la Chaise, 75007 Paris, France

Filed Jun. 9, 1977, Ser. No. 805,078
Int. Cl.[2] B27F *7/08*
U.S. Cl. 29—243.51 7 Claims

1. Apparatus for fixing U-sectioned junction clamps straddling the edge of a conveyor band or the like, by means of metal staples having the shape of an inverted "U" and a head and driven through holes provided in two legs of said clamps, which comprises, at least one driving punch opposite the head of the staples to be driven; an anvil adapted to engage one leg of said clamps which is opposite the other leg adapted to receive the head of said staples; means for mounting said anvil and driving punch for motion transversely of the conveyor band or the like; a bearing element registering with said other leg of the clamps and arranged for receiving said staples on one side of the position of said staples before driving same; a movable bearing member disposed on the other side of the position of said staples before driving same, said member being arranged, in its operative position, to hold said staples in a proper position before driving them and to guide same during the driving thereof; and a driving piston for actuating and moving



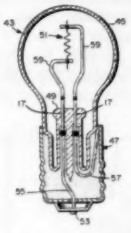
said movable bearing member to its operative position before engaging the staples to be driven.

4,144,629

METHOD FOR FORMING GLASS TO METAL SEAL

Paul M. Phillips, Sugar Grove, Pa., and John G. Donaldson, Tustin, Calif., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 747,362, Dec. 3, 1976, Pat. No. 4,071,658.
This application Dec. 8, 1977, Ser. No. 858,735
Int. Cl.[2] B22F *3/24*; B32B *15/16, 15/18, 15/20*
U.S. Cl. 29—420.5 7 Claims



1. A method of making a glass to metal seal of a metallic composite, said method comprising:

providing a tubular sheath member of a low carbon steel alloy, said sheath having a closed end and an open end;

filling said sheath member through said open end to an established level with a predetermined amount of nickel and iron powders wherein said nickel comprises about 42 percent by weight of said powders with the balance iron;

affixing a cover member having at least one small opening therein to said open end of said sheath member,

heating said sheath member having said nickel and iron powders therein and said cover member affixed thereto to a preestablished temperature sufficient to sinter said powders;

reducing said heated sheath member and said powders therein to form a metallic article having a central core portion of a wrought nickel-iron alloy and a sheath portion of a low carbon steel alloy, said sheath portion of substantially uniform thickness and bonded about said core portion; and

bonding a substantially uniformly thick shell of a glass wet-

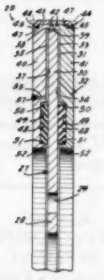
ting metal about said sheath portion of said reduced article.

4,144,630

METHOD OF MAKING TUNED TORSIONAL VISCOUS DAMPERS

William J. Troyer, Orchard Park, N.Y., assignor to Houdaille Industries, Inc.

Division of Ser. No. 705,158, Jul. 14, 1976, Pat. No. 4,046,230. This application Jul. 8, 1977, Ser. No. 813,899
Int. Cl.² B23P *19/00*
U.S. Cl. 29—436 **10 Claims**



3. In a method of making a tuned viscous torsional vibration damper assembly of the type having supporting disk means with a radially outwardly extending circular body and a radially inner hub portion adapted to be secured to a rotary member such as a crankshaft subject to vibrations to be damped by the damper, said body being received concentrically within a radially inwardly opening annular working chamber of an annular inertia mass, a viscous damping medium in said chamber between shear film spaced working surfaces of said body and said inertia mass, and said inertia mass having in its radially inner portion concentric annular grooves of substantial width at opposite sides of and facing axially toward said body contiguous to the opening from said chamber, with elastic tuning spring, spacing and sealing rings coupling opposing surface areas of said inertia mass in said grooves and opposing surface areas on said body, the improvement comprising:

assembling said rings in said grooves with the radially inner diameters of the rings adjacent to the radially inner diameters of said grooves and the radially outer diameters of the rings spaced from the radially outer diameters of the grooves;

providing concentricity maintaining shoulder means across the radially inner diameters of said grooves and in engagement with the radially inner diameters of the rings;

providing said rings of an original thickness greater than the ultimate spacing between said opposing surface areas to which the rings are coupled, and with the radially outer diameters of the rings less than the radially outer diameters of said grooves;

compressing said elastic rings axially between said opposing surface areas of said inertia mass in said grooves and said opposing surface areas on said body and by means of said shoulder means holding said rings against spreading radially inwardly, while expanding the elastic rings radially outwardly under compression, but leaving annular space about the radially outer diameters of the rings and thereby preventing contact of the radially outer diameters of the rings with any surfaces at the radially outer diameters of the grooves;

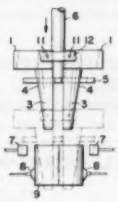
and effecting compressed bonding of the surfaces of contact of said rings to said opposing surface areas of said inertia mass and of said body.

4,144,631

METHOD AND APPARATUS FOR FITTING HEAT SHRINKABLE FILM SEALS TO NECKS OF VESSELS

Masaaki Fujio, 3-15-18 Aoyamadai, Suita, Japan

Filed Sep. 20, 1977, Ser. No. 834,984
Claims priority, application Japan, Sep. 17, 1976, 51-110866
Int. Cl.² B29C *27/30*
U.S. Cl. 29—446 **12 Claims**



1. A method for putting a tube of heat shrinkable film on over the neck of a vessel, comprising:

(a) inserting the operative ends of a plurality of guides into the tube of film, the guides having a mutual configuration which defines a substantially tubular inside space and a substantially tubular outside surface and being movable substantially radially with respect to one another so as to widen or narrow the inside space and the outside surface;

(b) spreading out the film tube by moving the guides apart so as to widen the outside surface defined by them;

(c) inserting the neck of the vessel into the inside space defined between the guides past their operative ends;

(d) slightly bringing together the guides so as to grip the neck of the vessel between their operative ends;

(e) pushing the tube of film along the guides and over the neck of the vessel; and

(f) releasing the grip of the operative ends of the guides on the neck of the vessel and removing them from it, leaving the tube of film on the neck.

4,144,632

METHOD OF MAKING TUBULAR ARTICLE

James D. Stroupe, Newtown, Pa., assignor to Sipler Plastics, Inc., Doylestown, Pa.

Continuation-in-part of Ser. No. 760,243, Jan. 17, 1977, abandoned, which is a division of Ser. No. 454,302, Mar. 25, 1974, abandoned. This application Jul. 3, 1978, Ser. No. 921,475
Int. Cl.² B29D *3/00, 23/10;* B29C *1/12*
U.S. Cl. 29—469.5 **2 Claims**

1. The method of making a unitary hollow rigid tubular article having a fixed tortuous non-planar longitudinal configuration with a smooth interior and a variable cross sectional area along the length thereof which comprises:

wrapping a flexible sheet of corrugated metal foil on an expansible and flexible core tube of elastic material,

superposing an elongated circumferentially expansible seamless knitted fabric tube over said foil,

applying a thermosetting resin compatible with said fabric and the metal foil to the exterior of the fabric tube,

inserting the core tube with said corrugated foil, said tube and said resin into an elongated smooth cavity in a mold, which cavity has a fixed tortuous non-planar longitudinal axis and a variable cross sectional area along said axis and is shaped to conform to the finished shape of the article,

expanding the core tube and shaping the corrugated metal under the restraint of the expanding resin carrying fabric tube to conform to the elongated mold cavity by pressure applied in the core tube and by the expansion forcing the resin into the interstices of the fabric into contact with the corrugated metal and adhering said fabric to said metal by said resin,

curing the resin, and

removing the core, tube, thereby forming said article.

4,144,633

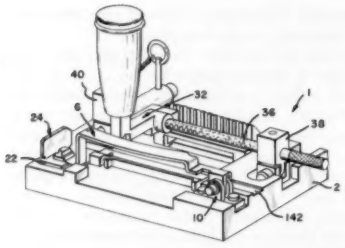
PORTABLE APPARATUS FOR CONNECTING WIRES IN CONNECTORS

John J. Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 1, 1978, Ser. No. 874,285

Int. Cl.[2] H01R *43/04*

U.S. Cl. 29—566.3 **5 Claims**



1. In a tool for connecting multiple wires into connectors having a platen on which is mounted a connector, a comb, a reciprocating inserter for inserting wires into contacts of a connector, and a shaft mounted parallel to a row of contacts in said connector, the improvement comprising:

said inserter having a pivot connection to said shaft,

said inserter having a blade portion insertable into a single one of said contacts,

a link extending from said pivot connection to said blade portion and extending between said shaft and a row of contacts in said connector,

said inserter having a manually actuated lever for pivoting said link about said shaft for engaging said blade portion against a wire and forcibly inserting the engaged wire into a single one of said contacts, and

means for indexing said inserter along said shaft a distance corresponding to the spacing between adjacent contacts in said row.

4,144,634

FABRICATION OF GALLIUM ARSENIDE MOS DEVICES

Chuan C. Chang, Berkeley Heights; Robert P. H. Chang, Warren; James J. Coleman, Plainfield, and Tan T. Sheng, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 28, 1977, Ser. No. 810,771

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **5 Claims**

1. A method comprising

(a) depositing an aluminum layer of thickness less than 400 Angstroms on a doped gallium arsenide substrate;

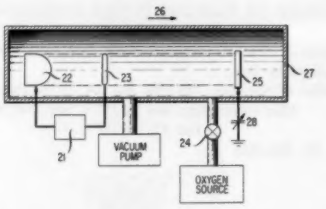
(b) placing the substrate in an oxygen environment comprising oxygen at a pressure of less than 10^{-3} Torr;

(c) directing a beam comprising essentially electrons of density between 10^8 electrons/cm^3 and 10^{12} electrons/cm^3 toward the aluminum layer in part by means of a magnetic field greater than 50 Gauss;

(d) biasing the substrate between 0.2 and 500 volts positive with respect to the source of electrons whereby a structure is formed with an aluminum oxide layer less than 400 Angstroms thick over a native oxide between 500 and 4000 Angstroms thick; and

(e) annealing the structure;

(f) depositing a metal electrode on the structure whereby a



MOS device with a breakdown strength of greater than $\pm 4 \times 10^6$ volts/cm, an asymptotic slope in both the inversion and accumulation regions with an absolute value of less than 0.02pF/V, and a surface state density less than 1×10^{11}/cm^2 is formed.

4,144,635

METHOD OF MANUFACTURING AN INDICATING ELEMENT

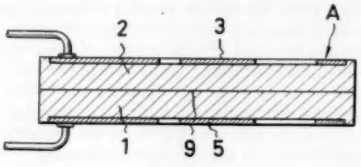
Toru Teshima, Hatano; Hoichiro Kashiwabara, Hino, and Yoshinori Uchiyama, Machida, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 625,685, Oct. 24, 1975, Pat. No. 4,019,196. This application Jan. 17, 1977, Ser. No. 760,085

Claims priority, application Japan, Nov. 22, 1974, 49-134971; Feb. 25, 1975, 50-25852[U]; Feb. 25, 1975, 50-25853[U]; Feb. 25, 1975, 50-25854[U]

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—572 **9 Claims**



1. A method of manufacturing an indicating element comprising:

forming a transparent semiconductor base plate (1) of a first conductivity type;

forming a second semiconductor layer (2) of a second conductivity type opposite to that of said first conductivity type and disposed on said transparent base plate (1), said base plate and said second semiconductor layer forming a luminescent diode;

forming a first electrode mask layer (3) on said second layer (2), said first electrode mask layer having light blocking portions over a substantial portion of said second layer which define a predetermined indicating pattern, said first electrode mask layer having void portions over the area of said indicating pattern; and

forming a second electrode mask layer (5) on a surface of said transparent base plate opposite the junction between said base plate and said second semiconductor layer, said second electrode mask layer having light blocking portions over a substantial portion of said base plate which define a second predetermined pattern thereon, said electrode mask layer having void portions over the area of said second indicating pattern;

whereby when electric power is applied across said first and second electrode mask layers, light is emitted from said

luminescent diode and is blocked by said light blocking positions of said electrode mask layers and is passed through said void portions thereof to simultaneously display said predetermined pattern.

4,144,636

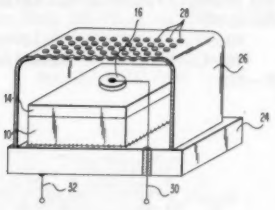
METHOD FOR MANUFACTURE OF A MOISTURE SENSOR

Paul J. Burkhardt, Poughkeepsie, and Michael R. Poponiak, Newburgh, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 701,788, Jul. 2, 1976, Pat. No. 4,057,832. This application Aug. 8, 1977, Ser. No. 822,589

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—590 **8 Claims**



1. The method for producing a moisture sensor comprising:

anodizing a region of a monocrystalline silicon body to form a porous silicon layer having an average porosity of 30 to 80 percent;

oxidizing the surface of said porous silicon layer to form a porous silicon dioxide layer having an average porosity of 15 to 40 percent; and

forming a plurality of spaced apart electrodes onto said sensor and wherein at least one of which is connected to the said porous silicon dioxide layer so as to allow the detection of electrical measurable changes due to adsorption of moisture in said porous silicon dioxide layer.

4,144,637

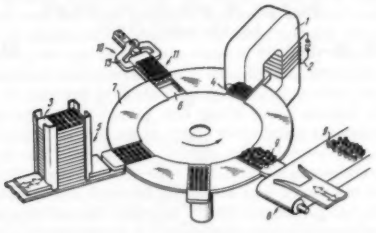
DEVICE FOR MAKING SETS OF NONMAGNETIC CURRENT-CONDUCTING COMPONENTS

Benyamin A. Ioffe; Jury A. Zommer; Robert K. Kalnin, and Alexandr S. Kanaev, all of Riga, U.S.S.R., assignors to Institut Fiziki Akademii Nauk Latviiskoi SSR, U.S.S.R.

Filed Jan. 5, 1977, Ser. No. 756,987

Int. Cl.[2] H05K *3/30*

U.S. Cl. 29—739 **5 Claims**



1. A device for arranging in a given pattern of arrangement sets of workpieces on corresponding workholders comprising means for delivering workholders to successive stations, means to deliver to said workholders at one of said stations a plurality of alike electrically-conductive workpieces to be arranged on the individual workholders in a given pattern thereon, pattern-arranging means for arranging the workpieces on corresponding workholders in a given pattern of arrangement including electrically-conductive means on the individual workholders and including electromagnetic means developing magnetic fields distributed by said electrically-conductive means on the workholders for arranging the workpieces thereon in a given pattern of arrangement, means energizing the electromagnetic means intermittently when workholders with workpieces thereon are at said electromagnetic means, and extractor means at a station at which the workholders are received with the workpieces thereon in a given pattern for extracting the workholders and workpieces thereon for delivery elsewhere.

4,144,638

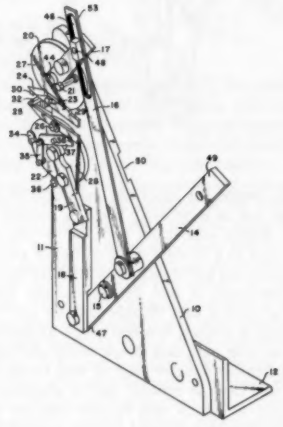
STATOR WIRE-CUTTING MACHINE

Scott Harris, Jonesboro, Ark., assignor to Abilities Unlimited, Inc., Jonesboro, Ark.

Filed Dec. 20, 1977, Ser. No. 862,651

Int. Cl.[2] B26D *7/18, 1/02;* **B23P** *19/00*

U.S. Cl. 29—762 **20 Claims**



1. A machine for removing wire from a stator, the stator being in a predetermined fixed position, the machine comprising:

a planar support for substantial alignment with the axis of the stator;

a cutter disc rotatably mounted on said support;

means for rotating said cutter disc;

knife means rotatably mounted on said cutter disc for penetration of the wires of said stator upon limited rotation of said cutter disc;

means mounted on said cutter disc for rotating said knife means with respect to said cutter disc and for cutting said wires upon further rotation of said cutter disc; and

means for removing the cut wire from the stator.

4,144,639

APPARATUS FOR FITTING FLEXIBLE ANNULAR PART AROUND AN ARTICLE

Seii Miyakawa, and Naoki Takahashi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1977, Ser. No. 862,625

Claims priority, application Japan, Dec. 22, 1976, 51-153402; Jan. 28, 1977, 52-7726; Nov. 7, 1977, 52-132516; Mar. 2, 1977, 52-23952[U]; Jun. 20, 1977, 52-79708[U]

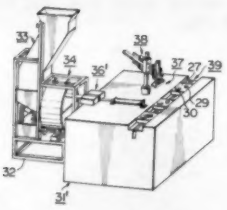
Int. Cl.[2] B23P *19/02;* **B23Q** *7/10*

U.S. Cl. 29—809 **6 Claims**

1. An apparatus for fitting a flexible annular part around an article comprising:

(a) separating means including a rotary drum mounted for rotation about a horizontally positioned axis and having a plurality of pins formed on an inner peripheral wall of said

drum, said pins being arranged in a row extending in a direction of rotation of said drum at a predetermined constant circumferential pitch, said pins being provided with projecting end portions spaced from said inner peripheral wall of said drum by a distance so as to receive only one flexible annular part, and means for rotating said rotary drum, so that said flexible annular parts are successively separated from a stack of parts at the bottom of said rotary drum one by one and picked up and moved up to an upper position in said rotary drum by the successive projecting end portions of the pins, as said drum is rotated by said means for rotating the drum, said flexible annular part being moved up to said upper position and then being dropped off from said pin as said pin passes a predetermined position at the upper portion of said drum as said drum is further rotated;



(b) guiding means for receiving said flexible annular part from said pin at a delivery position located at an upper position within said drum and for shifting said flexible annular part to a feeding position out of said drum;

(c) a chuck having a plurality of claws adapted to be located within the circle of said flexible annular part and to be moved to stretch said flexible annular part radially outwardly into a desired size and shape to thereby hold said flexible annular part, said chuck being adapted for stretching said flexible annular part at said fitting position, for placing said flexible annular part in alignment of parts of said article to which said flexible annular part is to be fitted, and for releasing said flexible annular part to transfer said annular part to said parts of said article which article is stationed at a predetermined fitting position; and

(d) means for reciprocating said chuck between said feeding position and said fitting position.

4,144,640

HAIR CLIPPERS

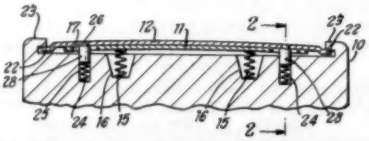
Alexis Buchholz, Hauterive, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed Dec. 1, 1977, Ser. No. 856,733

Claims priority, application United Kingdom, Mar. 11, 1977, 10293/77

Int. Cl.² B26B *19/06, 19/38*

U.S. Cl. 30—221 **6 Claims**



1. A hair clipper comprising first and second elongate toothed cutters, said first cutter being adapted to be driven in sliding reciprocation, means for driving said cutters in mutual sliding longitudinal reciprocation to effect a hair clipping operation, both said cutters being inherently slightly resilient along their length, means for locating said second cutter in position longitudinally and laterally while permitting said second cutter to curve resiliently to assume a similar curvature to said first cutter, resilient means and reaction means, said resilient means acting on the first cutter to urge the first cutter against the second cutter, said reaction means acting on the second cutter to oppose the force due to said resilient means, said clipper having a body member provided with a bore, said locating means includes at least one piston, said piston working in said bore, and means urging said piston into engagement with said second cutter to act thereon away from said first cutter and against said reaction means, said resilient means and said reaction means providing a force couple that imparts a similar curvature to both said cutters along the direction of reciprocation, whereby to tend to render uniform the pressure distribution between the two urged together cutters.

4,144,641

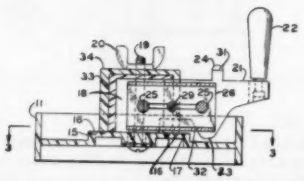
CUTTING APPARATUS

Edward D. Akselrad, 505 Glen Malcolm Dr., Glenshaw, Pa. 15116, and Stanley A. Akselrad, 226 Lexington Ave., Pittsburgh, Pa. 15215

Filed Feb. 1, 1978, Ser. No. 874,264

Int. Cl.² B65H *75/32;* **B26B** *11/00*

U.S. Cl. 30—289 **4 Claims**



1. A cutting device for linear type material comprising a base with guide means adapted to direct the material therethrough and upward onto a pressure cutting surface on the upwardly disposed plane of a raised boss concentrically engaging said base, a material pulling means rotatably engaging the said upwardly disposed plane of said raised boss and in concentric relation therewith and comprising a rotatable spindle with radially extending crank arm fixedly engaging said spindle and having material retaining and material grasping means thereon, and a cutting means clampedly engaging said crank arm and adapted to rotate therewith and having its cutting edge in proximate spaced relation to and upwardly disposed from said cutting surface.

4,144,642

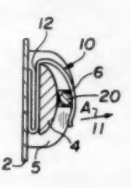
RETAINER MEMBERS FOR ORTHODONTIC BRACKETS

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Jul. 26, 1976, Ser. No. 708,301

Int. Cl.² A61C *13/00*

U.S. Cl. 32—14 A **94 Claims**



1. An orthodontic bracket arrangement comprising:

a bracket body having means for receiving an arch wire, means for connecting said bracket body to a tooth, and means defining an elongated passageway between at least a portion of the bracket body and the tooth mounting means; and

a retainer member slidably engageable with said bracket body and including a front portion to extend over at least

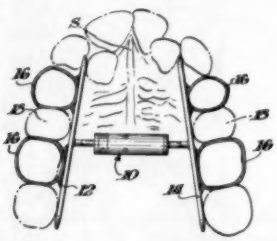
a portion of the front portion of said bracket body and over at least a portion of an arch wire received in said bracket body to retain said arch wire in said bracket body, and a resilient rear portion connected with said front portion and adapted to be inserted into said passageway, said rear portion comprising means for springingly engaging at least two opposed surface portions of said passageway defining means and for being springingly wedged between and in contact with both of said opposed surface portions of said passageway to retain said rear portion of said retaining device in said passageway with said front portion at least partially covering said arch wire.

4,144,643

MAXILLARY ORTHOPEDIC SUTURE SEPARATING ORTHODONTIC APPLIANCE

Stanley J. Krygier, Suite 103 Plaza Apt. Bldg., 1303 Delaware Ave., Wilmington, Del. 19806

Filed Jan. 19, 1977, Ser. No. 760,444
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 E **10 Claims**



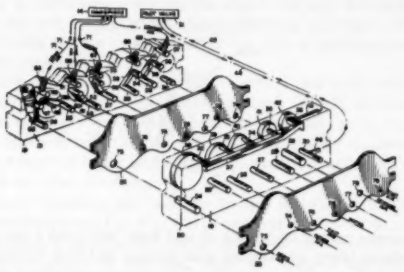
1. A maxillary orthopedic suture separating orthodontic appliance comprising a pair of spaced anchor plates for securement to bands on teeth on opposite sides of the upper jaw, adjusting means secured to said plates for linearly moving said plates toward and away from each other in controlled increments, said adjusting means including threaded means which are adjusted by relative rotation thereof without rotating said plates, said adjusting means including an internally threaded elongated rigid sleeve open at both ends thereof, an externally threaded rod threadedly engaged to said sleeve, said threaded rod being hollow and open at one end thereof, a nonthreaded rod telescopically engaging said threaded rod by being inserted therein through said open end of said threaded rod and projecting outwardly therefrom, said sleeve extending longitudinally around both said threaded rod and said non-threaded rod by means of said non-threaded rod being telescoped into said threaded rod and said threaded rod being inserted into said sleeve, an abutment on said non-threaded rod for contacting said sleeve at one of its ends thereof whereby the relative positioning of said sleeve on said threaded rod determines the extent of outward projection of said non-threaded rod from said threaded rod, one of said plates being secured to said non-threaded rod, the other of said plates being secured to said threaded rod whereby the spacing of said plates from each other is determined by the extent of outward projection of said non-threaded rod from said threaded rod, a lock nut threadably engaged on said threaded rod for contacting the other of said ends of said sleeve for fixing said sleeve in position after adjustment thereof on said threaded rod, said lock nut and said sleeve abutting each other when said appliance is in its operative position for preventing accidental rotation of said sleeve, said non-threaded rod being loosely inserted in said threaded rod without physical attachment thereto, said threaded rod having an interior thereof of non-circular cross-section, and the outer surface of said non-threaded rod having a cross-section generally complementary to said non-circular cross-section whereby complete relative rotation of said non-threaded rod in said threaded rod is generally minimized.

4,144,644

MODULAR SELECTOR VALVE ASSEMBLY

Robert A. Olsen, Palatine, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 17, 1976, Ser. No. 697,201
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 **11 Claims**



1. A modular selector valve assembly for controlling fluid flow for a plurality of dental handpieces, said assembly comprising a plurality of substantially identical modules arranged in series and each having a pair of parallel planar outer side faces and being oriented in side-by-side relation, each module having an arrangement of transversely-extending main flow passages with corresponding passages of the respective modules being in axial alignment, each module being divided along a plane parallel with said outer side faces into a valve section and a control section, said sections of each module thereby being provided with inner side faces disposed in side-by-side relation to each other, said valve section having a plurality of valve passages extending transversely therethrough and parallel with said main passages, said control section having a plurality of transverse control passages extending transversely therethrough and also parallel with said main passages, said outer side face of said control section being provided with at least one open-sided control channel communicating with all of said control passages and said outer face of said valve section having a plurality of open-sided connecting channels joining pairs of said valve passages, passage means provided by said control section and communicating with said control channel for conveying pilot air to and from said control channel and control passages, passage means provided by each valve section adapted to communicate with a dental handpiece and being in flow communication with certain valve passages of said pairs of valve passages, a first flexible gasket imposed between the sections of each module, said first gasket having openings aligned with said main passages and being flexible into and out of engagement with portions of said inner face of said valve section about said valve passages to open and close said passages in response to changes in the pressure of pilot air in said control passages of said control section, a second flexible gasket interposed between and engaging the outer faces of the control and valve sections of successive modules of said series, each second gasket having openings aligned with said main passages and having imperforate portions sealing the open sides of said control and valve channels, and means securing said modules and gaskets together.

4,144,645

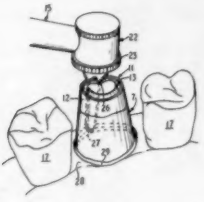
METHOD FOR PREPARATION OF DENTAL CROWNS AND BRIDGES

Kenneth H. Marshall, Castlecrag, Australia, assignor to Premach Pty. Limited, Sydney, Australia

Filed Nov. 24, 1976, Ser. No. 744,464
Claims priority, application Australia, Nov. 28, 1975, PC4102
Int. Cl.[2] A61C *5/10*
U.S. Cl. 32—42 **6 Claims**

1. A method of preparing a natural tooth for the fitting of a dental crown or bridge with the use of a rotatable cutting burr

supported in a handpiece and having a shading guide coextensive with, and rotatable about, said cutting burr and extending beyond the tip of said cutting burr for engagement sub-gingivally with said tooth, wherein the steps comprise fastening a block by its base, to the cusp of said tooth, said block having three pre-prepared external surfaces, a first one of said surfaces constituting said base, a second one of said surfaces being at an



opposite part of said block to said base, and a third one of said surfaces being an external wall joining said first and said second surfaces; and operating said handpiece to effect progressive free-hand reduction of the tooth structure of said natural tooth until said handpiece abuts both of said second and third surfaces simultaneously with said extending part of said shading guide in contact with a sub-gingival part of said tooth thereby to provide controlled limits of said reduction.

4,144,646

TORSIONAL ULTRASONIC VIBRATORS

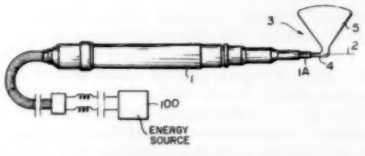
Kiyochika Takemoto, Kodaira; Yasuo Suzuki, Kurume; Yoshihito Ochiai, Fujisawa; Syozi Nakashima, Yamanishi, and Midori Hayashi, Yamakita, all of Japan, assignors to Lion Hamigaki Kabushiki Kaisha and Kano Denki Kabushiki Kaisha, both of, Japan

Continuation-in-part of Ser. No. 743,157, Nov. 18, 1976. This application Dec. 2, 1976, Ser. No. 746,818

Claims priority, application Japan, Dec. 5, 1975, 50-145273

Int. Cl.[2] A61C *3/00*

U.S. Cl. 32—40 R **11 Claims**



1. For use in the treatment of teeth, a torsional ultrasonic vibrator comprising a shaft having a central axis, a blade fixed to said shaft and extending at least in part laterally therefrom, said blade being small enough to be situated in the mouth of an individual to be treated and large enough to extend along a plurality of teeth in the mouth of the individual to be treated, said shaft having opposed end regions and said blade being fixed to said shaft at one of said end regions thereof, said blade being flat and having a thickness which is substantially less than the diameter of said shaft, and said blade having a relatively narrow end region where said blade has a minimum width, said narrow end region of said blade being situated next to said shaft, and said blade having a configuration according to which said blade has a width substantially greater than the width of said narrow end region thereof at a location situated outwardly. away from said shaft, so that said shaft can be situated at the exterior of the mouth of an individual to be treated directly next to the mouth while the narrow end region of said blade is situated directly next to said shaft at the entrance into the mouth of the individual to be treated and a portion of the blade which is wider than said narrow end region thereof is situated in the mouth for directing treatment to a plurality of teeth in the mouth, and vibrator means operatively connected with said shaft at the other of the opposed end regions thereof which is distant from said one end region to which said blade is fixed for angularly oscillating said shaft and said blade therewith about said axis at an ultrasonic frequency.

4,144,647

TECHNIQUES FOR THE MANUFACTURE OF GARMENTS AND APPARATUS FOR USE THEREIN

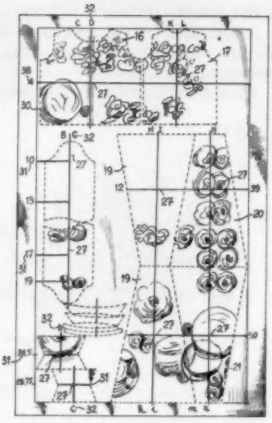
Nicolas Mosky, 7, rue Paradis; Jean Gay, 15, rue Rouget de l'Isle, and Paul Vigneau, 195, Bd de la Madeleine, all of 06000 Nice, France

Filed Feb. 23, 1977, Ser. No. 771,108

Claims priority, application France, Feb. 25, 1976, 76 05203

Int. Cl.[2] A41H *3/06*

U.S. Cl. 33—12 **11 Claims**



1. Apparatus for use in the manufacture of garments from material having an asymmetrical design thereon comprising:

means establishing reference markings along at least two adjacent sides of a length of material having an asymmetrical design thereon from which the garment is to be formed;

a plurality of patterns, said patterns each defining the shape of a different portion of the garment, said patterns including guide lines defined by at least two perpendicular crossing lines; and

a positioning plan, said plan bearing representations of the patterns with perpendicular guide lines and having reference markings corresponding to those established along adjacent sides of the length of material, the perpendicular guide lines of a pair of lines within each pattern on the said plan being respectively aligned with the reference markings on the said plan which correspond to the markings established along adjacent sides of the length of material, the plane providing for positioning of a particular pattern on a particular portion of the material, said crossing lines defining a portion of the asymmetrical design to be included on the material defined by the pattern.

4,144,648

CONNECTOR

Steven L. Grovender, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

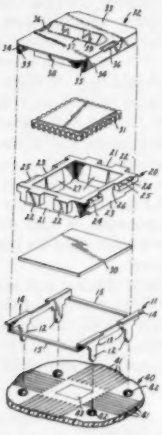
Continuation-in-part of Ser. No. 703,210, Jul. 7, 1976, abandoned. This application Jan. 17, 1978, Ser. No. 870,129

Int. Cl.[2] H01R *13/54;* **H05R** *1/12*

U.S. Cl. 339—75 M **6 Claims**

1. A connector for the discrete connection of close-spaced contact pads on a leadless integrated circuit carrier to traces on a printed circuit board, said traces including a central electrically isolated pad from which the other traces radiate out-

wardly in spaced relationship, said connector comprising a metallic fastener adapted to be secured to said circuit board and to nestably receive an insulating carrier positioning frame and a leadless integrated circuit carrier inserted therein, an electrically conductive elastomer sheet disposed within said positioning frame and interposed between said leadless integrated circuit carrier and said circuit board, said leadless integrated circuit carrier being centrally supported by said central



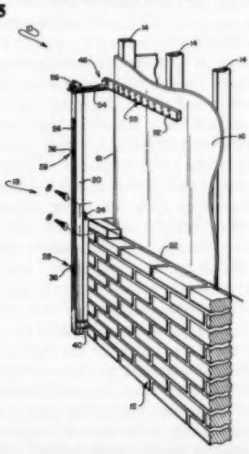
electrically isolated pad, and a retaining clip comprising a resilient metallic cover and a compressible pressure pad adapted to cover the entire top surface of said leadless integrated circuit carrier so that a uniform pressure is applied over said carrier top and on said underlying conductive elastomer sheet when said retaining clip is latched over said positioning frame and onto said fastener to thereby establish electrical interconnection between the pads on the leadless integrated circuit carrier and the spaced traces of the circuit board.

4,144,649

BRICK ALIGNMENT POLE

Charles W. Huston, 6931 Waterloo Rd., NW., Canal Winchester, Ohio 43111

Filed Aug. 11, 1977, Ser. No. 823,605
Int. Cl.[2] G01C *15/10*
U.S. Cl. 33—85 **2 Claims**



1. A pole for aligning courses of brick of a brick wall being constructed as a facing for a building structure construction wall comprising:

a hollow rectangular pole having no more than three adjusting means comprising an arm, a nail bar and a rule, the pole being of extended length having a vertical axis in operable position;

the arm being attached to the lower portion of said pole;

means for pivotally attaching the arm to the pole for pivoting the arm at times about a horizontal axis with respect to said pole and for rigidly holding the arm at times in place with respect to said pole;

means for attaching said arm to the end of said brick wall;

the nail bar being of substantial length and slidably attached near the upper end of the pole by a transversely projecting extension of said nail bar and means for rigidly clamping the extension to the pole and for allowing the extension to slide to other positions;

means for securing said nail bar to said building structure construction wall so that the connection of the bar to the extension is beyond the end of said construction wall;

means for attaching the rule, said rule being a vertically adjustable removable mason's rule attached along one side of the pole with said rule extending generally parallel to said vertical axis and for allowing the rule to be adjusted vertically on the pole, said attaching means comprising screws threaded into the pole and clamps held by said screws and extending over the rule whereby tightening the screws will cause the clamps to lock the rule in place with respect to said pole;

said rule having a plurality of measurements engraved thereon including measurements indicating the depth of one brick and interposed between such measurements of one brick in each case and measurement of the spacing between the bricks and the mortar layer for the bricks;

the nail bar being adjustable relative to the pole axis in the two dimensions of a plane perpendicular to the axis;

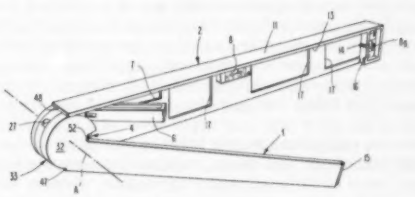
the extension of the nail bar being bifurcated to slide on each side of the attaching means, said attachment means comprising a threaded nut connected to a stud on the pole.

4,144,650

MULTI-FUNCTION LEVEL

Eugene Rawlings, 100 Glenolden Ave., Glenolden, Pa. 19036, and Stephen Guerrera, Pottstown, Pa., assignors to Eugene Rawlings, Glenolden, Pa.

Filed May 23, 1978, Ser. No. 908,705
Int. Cl.[2] B43L *7/06*
U.S. Cl. 33—88 **7 Claims**



7. In a multifunction level:

an elongated bubble arm carrying a plurality of bubble-vial means;

an elongated angle arm, one end of the angle arm being in sliding engagement with one end of the bubble arm;

shaft means;

means connecting said shaft means with said angle arm and with said bubble arm and providing for the arms to be relatively rotatable about the shaft axis as between a closed position and any of a plurality of open positions, said connecting means fixedly connecting the shaft means to one of said arms and slidingly connecting the shaft means to the other of said arms;

brake means surrounding said shaft to grip the shaft to generate forces opposing relative rotation of the angle and bubble arms; and

brake actuator means mounted on one of said arms and including an operating lever movable to at least two outboard positions, one on one side of the arms and the other on the opposite side of the arms and to an inboard position intermediate the outboard positions, movement to the inboard position causing said brake means to grip said shaft to generate forces opposing relative rotational motion of said arms and movement to either one of the outboard positions causing said brake means to relieve said forces, said movement of the operating lever to said inboard position being for use in holding the arms in said closed position or in any of said open positions.

4,144,651

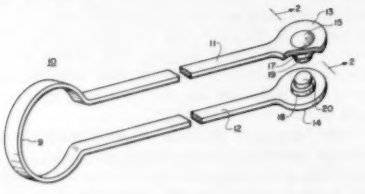
MATERIAL MARKER

Mary De Baun, 182A E. Shore Dr., Massapequa, N.Y. 11758

Filed Nov. 3, 1977, Ser. No. 848,309

Int. Cl.[2] G01B *5/14*

U.S. Cl. 33—189 **3 Claims**



1. A device for marking opposing sides of two layers of cloth positioned between a translucent pattern of a given color and a work surface comprising: a flat straight upper lever arm and a flat straight lower lever arm connected together at one end by a common handle; the other end of said upper lever arm having a first relatively-small dot of a sharply-contrasting color with respect to said given color of said translucent pattern, centrally located on the outside of said upper lever arm, and a first cloth-marking means, directly under said small dot, located on the inside; said first dot forming a point projecting slightly above the level of said outside of said other end of said upper lever arm; the other end of said lower lever arm having a second cloth-marking means, centrally located on the inside, aligned with and opposing said first cloth-marking means of said upper lever arm; said other end of said lower lever arm having a second relatively-small dot of a different, sharply-contrasting color with respect to said given color of said translucent pattern, centrally located on the outside of said other end of said lower lever arm and aligned with said second cloth-marking means, said second dot forming a point projecting slightly below the level of said outside of said other end of said lower lever arm; said upper lever arm being positioned between said pattern and the upper of said layers of cloth; and said lower lever arm being positioned between the lower of said layers of cloth and said work surface, whereby said first dot can be positioned under a given point of said pattern, and the drawing together of said upper and said lower lever arms will provide opposing marks simultaneously on said upper and said lower of said layers of cloth to correspond with said given point of said pattern.

4,144,652

WHEEL ALIGNMENT CHECKER TOOL ASSEMBLY

Albert Romak, 429 Major Dr., Northlake, Ill. 60164

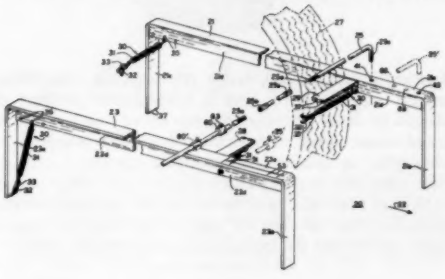
Filed Dec. 16, 1977, Ser. No. 861,259

Int. Cl.[2] G01B *5/24*

U.S. Cl. 33—203.20 **6 Claims**

1. A wheel alignment checker tool assembly for use with a pair of spaced coaxially and parallel aligned wheel means comprising in combination a pair of elongated frame members, each frame member being attachable to an associated one of said pair of wheel means and having a forward portion thereof spaced forwardly from the associated wheel means, first coaxially aligned reference areas provided on said forward portions of the pair of frame members, respectively, second coaxially aligned reference areas provided on said forward portions of the pair of frame members, respectively, said second aligned reference areas being spaced forwardly along said frame members from said first aligned reference areas by predetermined lineal spacing therefrom, said first and second aligned reference areas having centerline reference means, respectively, a cross-arm member to be extended traversely intersecting the forward portions of said pair of frame members and firstly aligned for intersecting alignment with said first reference areas, and secondly aligned for intersecting alignment with said second reference areas, and adjustable indicator means mounted on said cross-arm member and extending firstly in alignment with the centerline reference means of said first reference areas, and extending secondly in alignment with the centerline reference means of said second reference areas whereby indications are provided for both the degree and type of coaxial misalignment.

4. A wheel alignment checker tool assembly for an automobile having a pair of oppositely and coaxially aligned wheel units subject to coaxial misalignment, said checker tool assembly comprising in combination a pair of first frame members, each thereof being generally elongated and to be fixedly attached to and positioned with respect to an associated one of the pair of coaxially aligned wheel units to extend in parallel alignment therewith, and each thereof further having a forward extension portion extending forwardly from the associated wheel unit and a pair of gripper means, respectively, effective to engage opposite sides of the associated wheel unit for maintaining the parallel aligned attachment thereto, alignment reference means provided on the pair of first frame members and disposed in spaced relationship along the forward extension portions, respectively, including inner alignment reference positions and outer alignment reference positions, respectively, a second frame member to be extended traversely between the forward extension portions of said pair of first frame members firstly to be extended in alignment with the inner alignment reference positions thereof and secondly to be extended in alignment with the outer alignment reference positions thereof in forward displacement from the associated wheel units, and adjustable indicator means slideably mounted to the second frame member and being movable lengthwise therealong, said indicator means to be aligned firstly with the inner alignment reference positions of said pair of first frame members, and to be aligned secondly with the outer alignment reference positions thereof wherein the degree of movement of the indicator means between a position of alignment with the inner alignment reference positions and a position of alignment with the outer alignment reference positions provides the degree of coaxial misalignment, and the direction of said movement of the indicator means along the second frame member provides the type of coaxial misalignment.

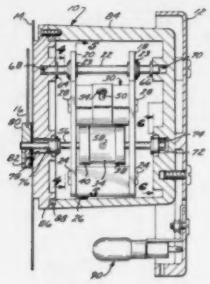


4,144,653

INCLINOMETER

William L. Gardner, 9818 Etiwanda Ave., Northridge, Calif. 91325

Filed May 12, 1978, Ser. No. 905,207
Int. Cl.[2] G01C 9/12
U.S. Cl. 33—391 12 Claims



9. In an inclinometer having a housing with a pendulum mounted within said housing for movement about a pivot point with a weight depended therefrom, having further a dial pointer, the improvement comprising:

an arcuate member defining a sector of a circle mounted on said pendulum;

a roller positioned adjacent said sector;

a coupling strap between said roller and said sector member, said coupling strap being wrapped around said roller and fixed to the ends of said sector member;

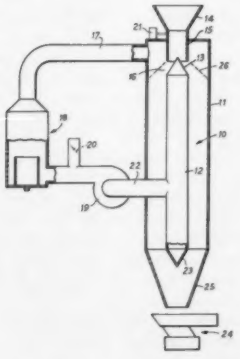
said roller having a shaft and being rotatable therewith and said shaft having said pointer mounted thereon and rotatable therewith.

4,144,654

DRYING APPARATUS

Derek J. Barr, London, England, assignor to Barr & Murphy Limited, London, England

Filed Jan. 28, 1977, Ser. No. 763,541
Claims priority, application United Kingdom, Feb. 10, 1976, 5226/76
Int. Cl.[2] F26B 3/00
U.S. Cl. 34—33 8 Claims



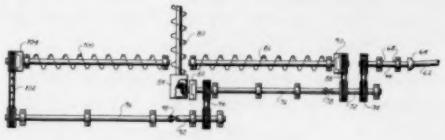
1. A method of drying a vertical annular column of granular solid material enclosed in a vessel comprising the steps of passing a current of drying gas downward through the material, withdrawing dried material from the bottom of the column, and adding fresh material at the top of the column and maintaining the top surface of the column in substantially frusto-conical form, having an angle of conicity corresponding to the angle of repose of the material added.

4,144,655

PORTABLE STORAGE BIN

Harold D. Harris, Lubbock, Tex., assignor to Harris and Thrush Manufacturing Company, Lubbock, Tex.

Division of Ser. No. 718,903, Aug. 30, 1976, Pat. No. 4,104,850.
This application Mar. 22, 1978, Ser. No. 888,950
Int. Cl.[2] F26B 19/00, 25/00; E04H 7/22
U.S. Cl. 34—236 9 Claims



1. A structure for grain storage comprising:

(a) a bin having a length several times the width,

(b) said bin supported by runners extending along the length thereof,

(c) said bin having a V-shaped bottom across the width,

(d) an elevator extending from the V-shaped bottom at about the midpoint of the length,

(e) a rear conveyor extending from the rear of the bin to the elevator,

(f) a front conveyor extending from the front of the bin to the elevator,

(g) elevator drive means attached to the elevator for driving same,

(h) elevator activating means attached to the elevator drive means for activating same,

(j) front conveyor drive means attached to the front conveyor for driving same,

(k) front conveyor activating means attached to the front conveyor drive means for activating same,

(m) rear conveyor drive means attached to the rear conveyor for driving same, and

(n) rear conveyor activating means attached to the rear conveyor drive means for activating same.

4,144,656

TEACHING MACHINE FOR STUDYING FOREIGN AND NATIVE LANGUAGES

Boris I. Podkopaev, Moscow; Ivan F. Klunko, Lubny Poltavskoi oblasti; Grigory S. Kiry, Lubny Poltavskoi oblasti; Vyacheslav V. Ocheretko, Lubny Poltavskoi oblasti; Lev I. Rozhdestvensky, Ufa, and Ljudmila D. Chervyakova, Moscow, all of U.S.S.R., assignors to Moskovsky Gosudarstvenny Pedagogichesky Institut Inostrannykh Yazykov Imeni M. Toreza, Moscow, U.S.S.R.

Filed Nov. 11, 1977, Ser. No. 850,681
Claims priority, application U.S.S.R., Nov. 12, 1976, 2419519
Int. Cl.[2] G09B 7/04
U.S. Cl. 35—9 A 5 Claims

1. A teaching machine for studying foreign and native languages, comprising:

(a) a task unit of the programme of successive algorithmic exercises;

(b) a programme carrier of said task unit;

(c) a memory of codes of answers to the questions of the programme of algorithmic exercises of said task unit;

(d) a remote control panel of said task unit, ensuring semiautomatic mode of operation of the teaching machine;

(e) a manually operable programmer of said task unit, made as a memory and intended for programming algorithmic exercises from any conventional text-book;

(f) a decoder for decoding the inner programmes of said

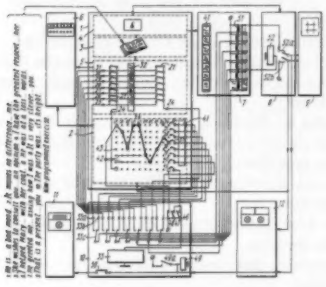
memory and indicating a correct answer, coupled to said memory and direct programmer;

(g) an answer input unit, having switching elements and ensuring by means of said switching elements the input of answers to the questions of the programme of algorithmic exercises, inputs and an output of said answer input unit; one of said inputs being coupled to said remote control panel;

(h) an answer analyzing unit having inputs and outputs, one of said inputs is coupled to said remote control panel, another of said inputs is coupled to said answer input unit; one of said outputs is coupled to said memory;

(i) a printout mechanism producing printed results of the student work and connected to said output of said answer analyzing unit;

(j) a reference unit ensuring, in case an incorrect answer is given, delivery of the reference material to each item of the programme of algorithmic exercises;



(k) a signalling unit indicating the correctness of the answer and the mode of operation of the teaching machine, an input and an output of said signalling unit; said input is coupled to one of said outputs of said answer analyzing unit;

(l) a control unit ensuring, in case a correct answer is given, transition to the task of the next exercise, inputs and outputs of said control unit, one of said outputs is coupled to said reference unit, another of said outputs is coupled to said signalling unit, the third of said outputs is coupled to said answer input unit; one of said inputs is coupled to said answer analyzing unit, another of said inputs is connected to said memory and the third of said inputs is connected to said manually operable programmer in order to ensure interaction of said manually operable programmer to said memory and said answer input unit, when algorithmic exercises having unambiguous solutions from conventional text-books are used.

4,144,657

TEACHING AID FOR MATHEMATICS AND NUMBER SYSTEMS

Matt J. Dumovich, 2151 Illion St., San Diego, Calif. 92110

Filed Sep. 30, 1977, Ser. No. 838,076

Int. Cl.[2] G09B *19/02*

U.S. Cl. 35—31 D **9 Claims**

1. An educational system comprising in combination:

a plurality of individual tracks of the same length disposed side by side and extending parallel,

indicia means dividing each of said tracks into different units of measure,

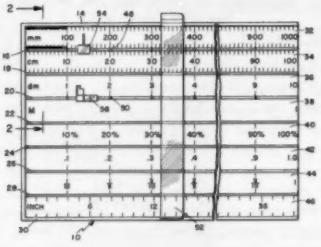
one of said tracks is divided into centimeters,

another of said tracks is divided into percentage units,

a further track is divided into fractions,

a slide indicator spanning a plurality of said tracks, and

a plurality of individual blocks, at least a plurality of which are of different sizes, at least one of each of said different size blocks corresponding to at least one of said different



units of measure for fitting into said channels for providing additional stimulus of units of measure.

4,144,658

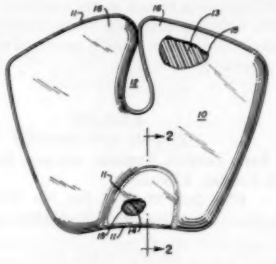
VISCOUS, FLOWABLE, PRESSURE-COMPENSATING FITTING MATERIALS AND THEIR USE, INCLUDING THEIR USE IN BOOTS

Jack C. Swan, Jr., Boulder, Colo., assignor to Hanson Industries Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 723,912, Sep. 16, 1976, Pat. No. 4,108,928, which is a continuation-in-part of Ser. No. 663,213, Mar. 2, 1976, abandoned. This application Mar. 2, 1978, Ser. No. 882,643

Int. Cl.[2] A43B *5/04, 19/00, 7/14*

U.S. Cl. 36—117 **101 Claims**



1. A deformable, pressure-compensating pad of selected shape and size, which comprises:

a shaped, flexible, protective enclosure having confined therein, a predetermined or selected amount of viscous, flowable, substantially stable, pressure-compensating material, which, together, provide a deformable, pressure-compensating pad;

said enclosure being shaped and constructed to allow the flow therein of confined material in response and conformance to continuously applied, deforming pressure exerted on the pad and upon or following relief of such exerted, deforming, flow-producing pressure;

said pad being characterized by at least in part recovering from deformation upon or following relief of deforming pressure;

said confined material being characterized by having a substantially homogeneous, substantially stable, viscous, flowable phase essentially consisting of wax and oil, and solid, discrete, lightweight, sturdy, glass microbeads, said glass microbeads being substantially uniformly distributed in and having a lower density than said phase with wax and oil;

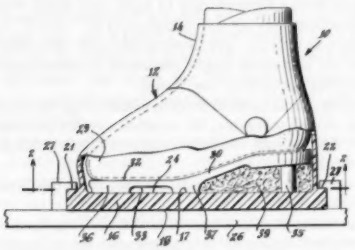
said confined material being further characterized by having a substantially homogeneous consistency and not substantially changing in volume responsive to ambient tempera-

tures or ambient temperature changes, being resistant to sag, flowing in response and conformance to continuously applied pressure, and, when confined during conditions of use, being resistant to flow in response to instantaneously applied pressure.

4,144,659
SKI BOOT

Joel H. Eisenberg, 53A Blackhawk La., Stratford, Conn. 06497

Filed Feb. 6, 1978, Ser. No. 875,178
Int. Cl.[2] A43B *5/04, 13/18;* A63G *9/16*
U.S. Cl. 36—120 **12 Claims**



1. A ski boot for holding a foot of a skier, said ski boot comprising an outer boot having a substantially inflexible upper shell and a sole having an inside base; support means disposed within said outer boot on said inside base in such a manner that said support means is capable of being laterally tiltable with respect to the ski and said outer boot upon inversion or eversion of said foot, and means for attaching said ski boot to a ski, said support means comprising a generally plate-like insert having an upper surface and a lower surface, said insert being configured so that when said insert is in its free state said upper surface does not necessarily conform to the sole of the foot of a skier, but said insert being made of a flexible material so as to conform to the sole of the foot of the skier when the ski boot is operatively mounted on the skier's foot, said insert having a rear heel balance means disposed at said lower surface at one end and a front toe balance means disposed at said lower surface opposite said rear balance means, both of said balance means contacting said inside base when said insert is in place.

4,144,660
ADJUSTABLE STRETCHING FRAME

Terrence R. Lamb, Chevy Chase, Md., assignor to Art Products, Inc., Chevy Chase, Md.

Filed Aug. 9, 1977, Ser. No. 823,111
Int. Cl.[2] D06C *3/08*
U.S. Cl. 38—102.5 **15 Claims**

1. An adjustable stretching frame for stretching canvas paintings comprising:

a plurality of frame and corner segment members having a front face over which a canvas is to be stretched;

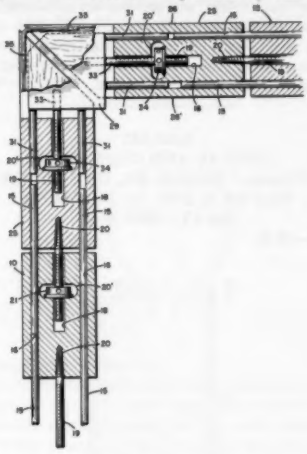
means for interconnecting said frame and corner segment members with each other to form a rectangular frame;

means for adjusting the spacing between adjacent frame and corner segment members; and

means for maintaining a canvas to be stretched on the frame in a spaced apart relationship from the face of said frame comprising:

(a) a stretchable bead, and

(b) means for mounting said stretchable bead to said frame and corner segment members adjacent to an edge of said segment members, wherein when adjacent frame segment members are separated by said adjustment

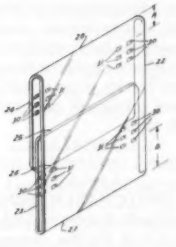


means, said stretchable bead is stretched between the adjacent frame segment members.

4,144,661
ADVERTISING DISPLAY DEVICE FOR NEWSPAPERS AND ANALOGOUS ARTICLES

Clarence Gosanko, Seattle, Wash., and Robert Weinberg, Beaverton, Oreg., assignors to National Enquirer Inc., New York, N.Y.

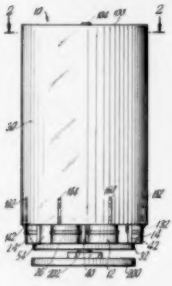
Continuation-in-part of Ser. No. 657,833, Feb. 13, 1976, Pat. No. 4,051,615. This application Sep. 9, 1977, Ser. No. 787,237
Int. Cl.[2] G09F *3/18*
U.S. Cl. 40—10 D **9 Claims**



1. A display device, particularly for displaing newspapers or analogous articles on a display rack, comprising a folded element having a transparent front panel and a rear panel juxtaposed therewith so as to bound an interior space in which an article to be displayed is received, said front panel having a generally rectangular configuration of predetermined area, said rear panel comprising a main portion forming a common unitary edge with said front panel, and a free edge, said main portion having a generally rectangular configuration of area generally coextensive with said predetermined area of said front panel, said rear panel also comprising a bent lip portion forming a groove for receiving the free edge of said main portion with snap-type action so as to press the article substantially flat intermediate said panels and impart more prominence to the article; and means on said rear panel for adjustably mounting said element at any one of a plurality of positions relative to the display rack so that the article contained intermediate said panels is visible to a viewer at any selected one of said positions, said means comprising one set of two pairs of

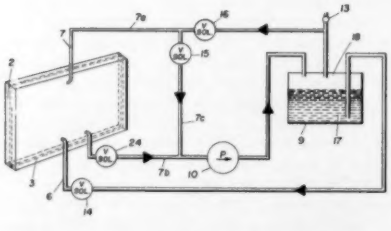
holes, each pair being located at opposite sides of said main portion of said rear panel and being spaced at a predetermined distance from each other, and another set of two pairs of holes located inwardly of said one set at opposite sides of said rear panel, each pair of said other set being spaced at a predetermined distance from each other which is smaller than said first-mentioned predetermined distance.

4,144,662
DISPLAY AND DISPENSER
Halbert H. Drexler, 7 Bagatelle Rd., Dix Hills, N.Y. 11746
Filed Jul. 5, 1977, Ser. No. 812,792
Int. Cl.[2] G09F *3/18*
U.S. Cl. 40—10 D **9 Claims**



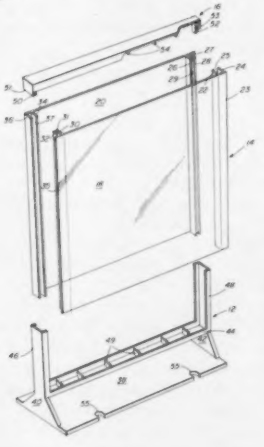
1. A display and dispensing device; comprising:
(a) casing means having a transparent outer wall that forms a hollow enclosure open at its top and its bottom;
(b) base means secured proximate the bottom of said casing means;
(c) generally radially extending vertical wall means disposed within said casing means and dividing same into a plurality of vertical and hollow columns, wherein each vertical hollow column is sized to store a stack containing a plurality of containers of predetermined size and configuration;
(d) opening means, of predetermined size and configuration, formed in said casing means proximate the bottom thereon, said container being smaller than said opening to permit removal of one container from said stack; and
(e) an information carrier means sized to fit between the vertical wall and proximate said outer wall so as to be viewed through same.

4,144,663
SWITCHABLE SIGN
Leif H. Saenger, and Per R. Danielsen, both of Halden, Norway, assignors to Norlux A/S, Halden, Norway
Continuation-in-part of Ser. No. 629,068, Nov. 5, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,360
Claims priority, application Norway, Nov. 6, 1974, 743993
Int. Cl.[2] G09F *13/24*
U.S. Cl. 40—406 **6 Claims**



1. A sign for selectively displaying information to a viewer and obscuring the information from the viewer looking at the sign from one direction, which comprises
a. a pair of rigid and light-transmitting plates of an acrylic resin arranged parallel to each other and interconnected at respective edges thereof to define a closed cavity of constant volume between the inner, facing surfaces of the plates, the outer surface of a front one of the plates facing the viewer and the outer surface of a rear one of the plates facing in a direction opposite to the one direction,
1. the information being arranged permanently on the outer surface of the rear plate,
b. a plurality of rigid pins interconnecting the facing surfaces of the plates, the pins being of light-transmitting material and supporting the plates against deformation,
c. a closed reservoir containing a liquid substantially impervious to the transmission of light, the liquid being liquid petrolatum having a freezing point of −54° C., a fast and light-impervious dye homogeneously dissolved therein and an anti-static agent dispersed therethrough, and an air-filled space over the liquid,
d. a closed fluid conduit system connecting the closed cavity and closed reservoir, the conduit system including
1. a first valved conduit connecting the air-filled space to the cavity,
2. a second valved conduit connecting the liquid to the cavity,
3. a pressure release valve in the first conduit, and
4. control means for selectively delivering liquid from the reservoir into the cavity through the second conduit while concomitantly withdrawing air from the cavity into the air-filled spaced through the first conduit, and delivering air from the space into the cavity through the first conduit while concomitantly withdrawing liquid from the cavity into the reservoir through the second conduit, whereby the cavity is rapidly and completely filled with the liquid to obscure the information and emptied of the liquid to display the information, and
e. a light source mounted behind the rear plate in said one direction for illuminating the information.

4,144,664
WEATHERPROOF CHANGEABLE DISPLAY DEVICE
Peter De Korte, 329 Calvin Ct., Wyckoff, N.J. 07481
Filed Nov. 17, 1977, Ser. No. 852,374
Int. Cl.[2] G09F *15/00, 23/00*
U.S. Cl. 40—609 **2 Claims**



1. A weatherproof display device for changeable display signs for posting the prices and taxes applicable to a commodity comprising:

a base assembly having a flat base plate, two triangular support struts rising vertically from each end of said base plate, a horizontal U-shaped channel between said triangular support struts, and two vertically oriented U-shaped support channels rising vertically from said support struts;

said base assembly being integrally formed from one piece of a strong plastic material;

a box assembly including from two substantially identical transparent panels, each of said panels having two perpendicular spaced apart tabs along a first vertical edge, the outermost of said tabs forming one side of said box-like structure; and each of said panels having two vertically extending perpendicular tabs recessed somewhat inward from a second vertical edge;

said box assembly being formed by inverting one of said transparent panels and pressing said two panels together such that said outer tabs on the first vertical edge of each panel form the vertical sidewalls of said box-like structure and said inner tabs along the first vertical edge of each panel are gripped snugly by the inner recessed tabs of the opposed panels

said box assembly being inserted within said U-shaped channels of said base assembly to close its base end;

a cap assembly formed from one piece of a strong molded plastic having basically an inverted U-shaped horizontal channel whose interior width and depth dimensions correspond to the exterior dimensions of the top of said box-like structure, ends of said horizontal U-shaped channel being closed by end panels and a downward extending tab recessed slightly inward of said end panels to form a gripping channel on each end of said cap assembly;

said cap assembly fitting snugly across the top of said box-like assembly to fully enclose said box-like assembly; and

said box assembly being easily removable from said base assembly to permit the insertion and removal of pricing books and signs.

4,144,665

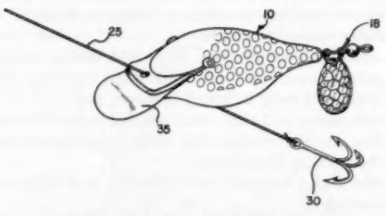
FISHING LURE

Donald W. Dake, 6460 Salem Ave., Clayton, Ohio 45315

Filed Aug. 15, 1977, Ser. No. 824,816

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.35 **3 Claims**



1. A casting lure comprising upper and lower body portions joined together and defining an enclosed air chamber therebetween, means on said lower body portion defining a first forwardly extending bill, means on said upper body portion defining a second forwardly extending bill terminating short of the forward extent of said first bill and defining with said first bill a forwardly opening slot, and a diagonal line-receiving opening formed in said body portions and extending therethrough in intersecting relation to said bills from a position above said upper body portion adjacent the forward edge of said second bill to an exit position in said lower body portion in underlying relation to said chamber.

4,144,666

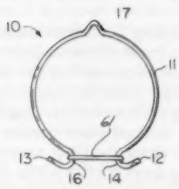
FISHING BOBBER HAVING LINE RETAINING RING

E. Frank Maycock, 5332 Newport, Omaha, Nebr. 68152, and Donald J. Orr, Box 27, Arnolds Park, Iowa 51331

Filed Feb. 16, 1977, Ser. No. 769,121

Int. Cl.[2] A01K *93/00*

U.S. Cl. 43—44.95 **4 Claims**



1. A fishing float comprising:

(a) a main body element which floats substantially at or near the surface of water, said main body element having a length and circumferential surface, said main body element being at least partially circular in cross section and wherein said circular cross sectional portion of said main body element includes holding means thereon, and wherein said holding means comprises two linearly aligned arrays of surface protrusions extending around said circular cross sectional portion of said main body element, said two arrays being spaced away from each other along the length of said main body element; and

(b) a retaining ring resiliently urged into contact with a portion of said circumferential surface of said main body, said retaining ring having two free spaced apart ends forming a gap therebetween, each of said free ends including guide means thereon for directing a line between said main body and said retaining ring, and wherein said retaining ring is in contact with said circular cross sectional portion of said main body element, and wherein said main body element holding means coacts with said retaining ring to maintain its location relative to the length of said main body element, and wherein said two arrays being spaced away from each other along the length of said main body element a distance slightly larger than the thickness of said retaining ring.

4,144,667

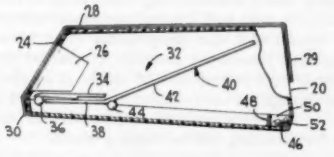
SELF-LOCKING DISPOSABLE RODENT TRAP

Anthony J. Souza, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed Jul. 11, 1977, Ser. No. 814,835

Int. Cl.[2] A01M *23/18*

U.S. Cl. 43—61 **9 Claims**



1. An animal trap, comprising:

a housing defining an enclosure and having an entrance opening formed therein;

a door member pivotally mounted with the enclosure to move between positions allowing closure of the entrance opening and access through said entrance opening;

trigger means pivotally mounted within the enclosure to cam the door member into a position blocking access through the entrance opening; and,

means for maintaining the door member in blocking relation to the entrance opening, therby to prevent the door member from moving to a position allowing access through the entrance opening after the door member has blocked access therethrough, wherein the trigger means comprise:

a forward cam portion formed of a flat plate-like body member;

an inclined plane portion formed of a flat plate-like body member, the portions joining each other at an obtuse angle; and,

pivot means mounting the trigger means for pivotal movement within the enclosure at the juncture of said portions, the door member surmounting the forward cam portion and the enclosure when the trap is in the set position, an animal entering the trap and exerting force by virtue of its weight on the inclined plane portion causing the trigger means to pivot about the pivot means, the inclined plane portion moving downwardly within the enclosure and the forward cam portion moving upwardly to the cam the door member into blocking relation to the entrance, and

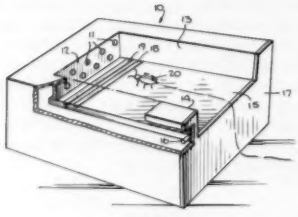
wherein the maintaining means comprises a lateral ledge formed on the inner wall of the door member medially thereof, the ledge having a surface forming a shoulder which abuts the forward edge of the forward cam portion to prevent downward movement of the forward cam portion within the enclosure after the door member has blocked access to the entrance opening.

4,144,668

INSECT TRAP

Kris Darncharnjiti, 413 W. 56th St., Apt #1, New York, N.Y. 10019

Filed Sep. 19, 1977, Ser. No. 834,548
Int. Cl.[2] A01M *1/04, 1/22*
U.S. Cl. 43—107 **29 Claims**



1. A trap for insects having a location for an attractant and insect entrapping means, comprising in combination a plurality of conductive elements arranged such that an insect can encounter said conductive elements en route to said attractant location, an electric sensing circuit including low voltage energizing means and detecting means coupled to said conductive elements with said low voltage means and said detecting means related such that the presence of an insect which encounters said conductive elements is detected before said insect can retreat in response to the level of electric current passing through its body exceeding its threshold of sensitivity thereto, and means coupled responsively to said detecting means for actuating said entrapping means.

4,144,669

MULTIPLE FUNCTION WATER-GOING TOY

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

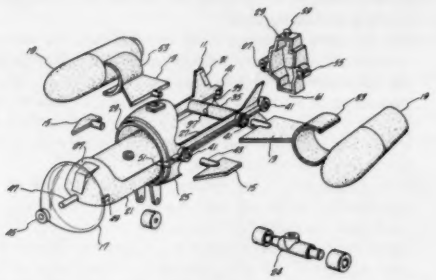
Filed Jun. 13, 1977, Ser. No. 806,141
Int. Cl.[2] A63H *33/06*
U.S. Cl. 46—17 **15 Claims**

1. A toy plane including a plurality of detachable parts, said parts comprising:

a frame member;

stabilizer means attachable to said frame member for configuring said frame member as a toy plane;

a cowling member mountable on a front section of said frame member;



a tank member mountable to said frame member and to said cowling member, and

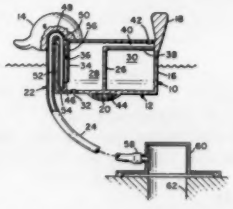
puzzle means in said tank member for utilizing said tank member as a separate puzzle toy, said puzzle means comprising a ball, a plurality of apertures and at least one slot, the ball being guidable through the apertures into the slot.

4,144,670

CYCLIC-ACTION, SIPHON-OPERATED BUOYANT TOY

Walter S. Gearhart, 448 Orlando St., State College, Pa. 16801

Filed Dec. 15, 1977, Ser. No. 860,876
Int. Cl.[2] A63H *23/00*
U.S. Cl. 46—91 **10 Claims**



1. A cyclic-action buoyant toy comprising:

a body, said body adapted to float in at least two predetermined orientations in water said body including,

a water-receiving portion,

a water inlet means, said water inlet means adapted to permit water flow into said water-receiving portion when said body is floated in water, and

a vent means, said vent means adapted to provide a water-free conduit between said water-receiving portion and the ambient atmosphere;

a siphon means connected to said body, said siphon means including,

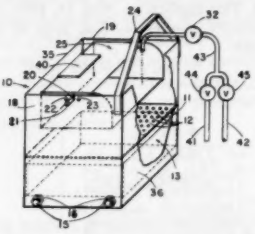
a water conduit, said water conduit including an intake end and a discharge end; and

said body and said siphon means so correlated that when said body is floated in water and said discharge end of said water conduit is positioned substantially below said body and open for unrestricted water flow therefrom, said water-receiving portion will receive water, and said siphon means will intermittently discharge water through said discharge end of said water conduit at a rate substantially greater than said water flow into said water-receiving portion, whereby said body is adapted to oscillate between said two predetermined orientations.

4,144,671
APPARATUS FOR GROWING BEAN SPROUTS

Bo T. Lee, 2621 Garvey Ave., Alhambra, Calif. 91803

Filed Oct. 11, 1977, Ser. No. 840,584
Int. Cl.[2] A01G *31/02, 27/00*
U.S. Cl. 47—14 4 Claims

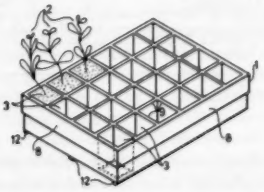


1. Apparatus for home growing of bean sprouts, comprising:
(a) an external housing having an opaque surrounding side wall providing top and bottom openings;
(b) an opaque, horizontally disposed divider plate within the housing attached peripherally to said housing side wall to separate said housing into an upper compartment and a lower compartment, said divider plate being formed with a plurality of uniformly spaced orifices extending therethrough;
(c) a bean sprout container tray having an outer wall extending upwardly from a sloping bottom connected with a drainage outlet, and an open top, said tray being topwise insertable into the lower compartment through the bottom opening of said housing, the outer wall of said tray being conformed to closely fit within the bottom wall opening of the housing and in the inserted position forming a closure for the bottom opening of the housing;
(d) a controlled water supply line having an outlet positioned above the top opening of said housing for releasing water at a predetermined rate; and
(e) a self-righting tilt container pivotally mounted in the upper compartment of said housing above the divider plate for gravitally receiving successive container tilting charges of water from the supply line outlet, said tilt container in its normal non-tilted position providing a closure for the top opening of said housing.

4,144,672
EXPANDED PLASTIC PLANT CONTAINER WITH BREAK-AWAY BOTTOM

John Gradwell, and William Daly, both of Pretoria, South Africa, assignors to Jack Lazarus, Pretoria, South Africa

Filed Feb. 9, 1977, Ser. No. 766,945
Int. Cl.[2] A01G *9/10*
U.S. Cl. 47—73 4 Claims

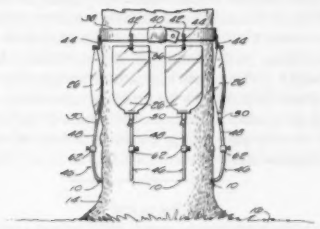


1. An open-topped container made of a suitably brittle expanded plastics material for cultivating one or more plants individually contained in a corresponding number of cavities of said container containing a cultivating medium for said plant(s), each cavity comprising a base and surrounding side walls and drainage hole means through the base thereof, each cavity being constructed and arranged for easy transplantation of such plant(s) by said base including a peripheral line of weakness in the base at the intersection of the base and the respective side walls for an application of pressure against the base to cause said base to break loose from the remainder of the container, wherein the base has an average breaking strength along the line of weakness, calculated by dividing a fracture zone span length by a corresponding side length of the base, of between 20 and 35% of such average breaking strength of the base without any line of weakness therein, drainage hole means in spaced-apart relationship in peripheral positions of the base, combining to form said peripheral line of weakness, the drainage hole means comprising drainage holes each being oblong, having a width which nowhere in plan view exceeds 4 mm, the elongation coinciding with the line of weakness.

4,144,673
SYSTEM AND METHOD FOR INTRODUCING SYSTEMIC TREATMENT LIQUIDS INTO TREES AND SIMILAR PLANTS

Danny H. Quast, 8010 N. Range Line Rd.; Dennis R. Fermenich, 5674 N. 37th St., and Herman H. Granof, 2450 W. Good Hope Rd., all of, Milwaukee, Wis. 53209

Filed Aug. 29, 1977, Ser. No. 828,311
Int. Cl.[2] A01G *29/00*
U.S. Cl. 47—57.5 12 Claims



1. A system for uniformly introducing systemic treatment liquids into trees or similar plants comprising
a plurality of substantially identical tubular injector nozzles, each adapted to be inserted into one of a plurality of injector holes located in a tree at uniform circumferential intervals and through which the treatment liquid can be introduced into the tree,
a plurality of substantially identical, sealed containers, each containing a prescribed amount of the treatment liquid at the prescribed concentration for a single treatment through one of the injector holes,
a plurality of substantially identical, flexible, tubular connecting base assmelbies, each having a first end adapted for connection to and opening of one of said containers and a second end adapted for connection to one of said injector nozzles, and
a flexible support member adapted to be wrapped around the tree and secured thereto at a location above the desired vertical location of the injector holes, said support member including a plurality of support means each of which is adapted for suspending one of said containers from said support member, said support means being spaced on said support member at uniform intervals corresponding to the prescribed circumferential spacing for the injector holes.

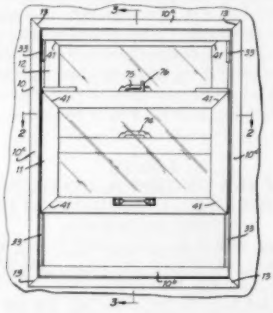
4,144,674
WINDOW CONSTRUCTION

Nathan Dovman, 6713 Akron St., Philadelphia, Pa. 19148

Filed Dec. 29, 1977, Ser. No. 865,531
Int. Cl.[2] E05D *15/22*
U.S. Cl. 49—417 10 Claims

1. In a window construction of the character described, in

combination, a master frame having a window opening adapted to accommodate therein a pair of double-hung window sashes of identically the same size and shape, said master frame being provided in the vertically extending sides thereof with oppositely disposed spring-loaded parting strip elements which are normally biased into positions intervening the proximate sides of said double-hung window sashes, said parting strip elements being adapted to be oppositely pressed into said



sides of said master frame whereby to permit successive inward tilting of the inside and outside window sashes when the latter are respectively raised and lowered within said master window frame, and means for automatically holding said spring-loaded parting strip elements respectively in their outwardly pressed positions to provide clearance for inward swinging movement of the outside window sash about a pivotal axis closely paralleling the bottom end of said lowered outside window sash.

4,144,675

APPARATUS FOR TREATING TOP ENDS OF FLEXIBLE CORDS

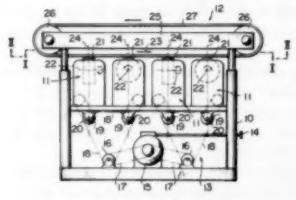
Hiroshi Takahashi, Yokohama; Yasutami Muto, Ageo; Hiroshi Suzuki, Sagamihara, and Shiro Fukuda, Urawa, all of Japan, assignors to Lion Hamigaki Kabushiki Kaisha and K. T. Manufacturing Co., Ltd., both of Tokyo, Japan

Filed May 11, 1977, Ser. No. 796,113

Claims priority, application Japan, May 12, 1976, 51-53981

Int. Cl.[2] B24B *19/00*

U.S. Cl. 51—76 R **7 Claims**



1. An apparatus for treating the outer ends of flexible cords comprising holding means for holding articles having flexible cords, continuously delivery means for delivering said holding means in a predetermined direction, a plurality of motor-driven cylindrical grinding means each having a central axis, each of said cylindrical grinding means being disposed at a position adjacent said holding means, and means for continuously rotating each of said cylindrical grinding means around said central axis thereof and around an axis perpendicular to said central axis, said cylindrical grinding means being arranged so that directions of rotation of every two adjacent cylindrical grinding means around said axes perpendicular to said central axes are reversed with respect to each other.

4,144,676

MACHINE TOOL HAVING FRAME MOUNTED HEAD AND TAIL STOCKS

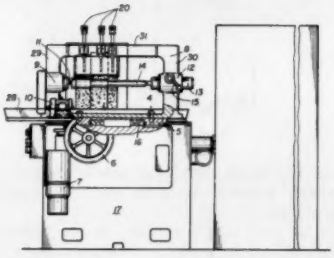
Hans H. Moll, c/o Roland Offsetmaschinenfabrik Faber & Schleicher AG, 6050 Offenbach am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 721,973, Sep. 10, 1976, abandoned. This application May 11, 1977, Ser. No. 795,744

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1975, 2541089

Int. Cl.[2] B24B *5/04*

U.S. Cl. 51—105 R **6 Claims**



1. A centerless grinding machine capable of operating as a centered grinding machine, comprising a machine base, slide means including guide ways and a table movably supported on said guide ways on the machine base, a closed frame structure (**8**), means (**4**) for replaceably securing said closed frame structure to said table (**5**), a head stock (**9**) secured in said closed frame structure (**8**), a tail stock (**12**) secured in said closed frame structure (**8**), and motor means (**10**) mounted to said closed frame structure (**8**) for driving said head stock (**9**), whereby the closed frame structure (**8**) with its head stock, tail stock and motor means form an exchangeable unit.

4,144,677

OVERRUNNING PROTECTION FOR A GRINDING WHEEL

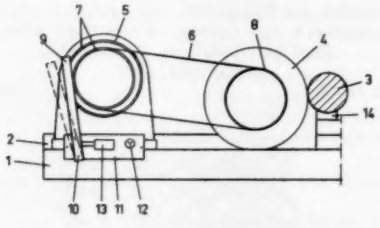
Bengt Nilsson, Lidköping, Sweden, assignor to Lidköpings Mekaniska Verkstads AB, Lidköping, Sweden

Filed Apr. 19, 1977, Ser. No. 788,929

Claims priority, application Sweden, May 13, 1976, 7605440

Int. Cl.[2] B24B *47/18*

U.S. Cl. 51—134.5 R **4 Claims**



1. Overrunning protection means for a grinding machine comprising a grinding wheel mounted in a head stock, means mounting the head stock on a machine frame for movement in a direction toward and away from a work rest for the work piece and drive means for rotating the grinding wheel including means for rotating the grinding wheel at a first angular velocity and a second lower angular velocity, the improvement comprising a blocking member operable between a first position permitting engagement of the drive means to rotate said grinding wheel at any angular velocity and a second

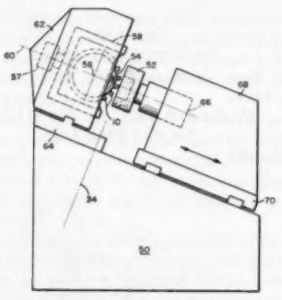
position permitting engagement of said drive means to rotate said grinding wheel at said second lower velocity only, control means for selectively effecting actuation of said drive means including first sensing means for sensing the position of said blocking member, second sensing means for sensing the position of the head stock in relation to the grinding position of the work piece at said work rest and, means operatively connecting said first and second sensing means to said drive means to control the same in a predetermined manner so that said drive means is actuated only if said first sensing means senses said blocking member in said second position or if said second sensing means senses the head stock in a predetermined position relative to the work piece.

4,144,678

METHOD FOR RESHARPENING CUTTING BLADES FOR GEAR CUTTING MACHINERY

Charles G. Ellwanger, and Harry Pedersen, both of Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,197
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—288 **4 Claims**



1. A method of grinding which includes steps of establishing precise positioning of a plurality of cutting tools relative to a grinding plane of a grinding wheel to thereby sharpen (a) a topland surface, (b) a first side relief surface, and (c) a second side relief surface on said plurality of cutting tools, comprising

mounting said cutting blades in a serial arrangement in a circular holder which allows selected corresponding surfaces of the cutting blades to be sharpened as the cutting blades and grinding wheel are relatively advanced, said mounting arrangement being such that all of the cutting blades are carried in positions which are correspondingly the same relative to a reference plane that is common to all cutting blades,

spinning said holder relative to said grinding wheel, said spinning taking place in a reference plane which is parallel to reference sides of said cutting blades, said reference plane being positioned to intersect a reference axis about which each blade is swung during a grinding operation, said positioning being such that the reference axis is located at a set radial distance from one corner of the topland surface and an adjacent side relief surface of a cutting blade in a grinding position relative to the grinding plane of the grinding wheel,

relatively advancing the cutting blades and the grinding wheel to form a topland surface and a first side relief surface on each of the cutting blades,

turning over all of the cutting blades, and

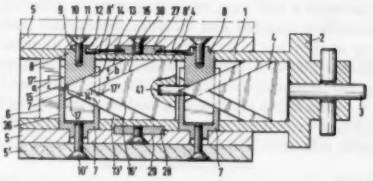
relatively advancing the cutting blades and the grinding wheel to form a second side relief surface on each of the cutting blades.

4,144,679

HONING TOOL

Franz Henninghaus, Dormagen, Fed. Rep. of Germany, assignor to Ferdinand Henninghaus, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,418
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 2659766
Int. Cl.[2] B24B *33/08*
U.S. Cl. 51—338 **8 Claims**



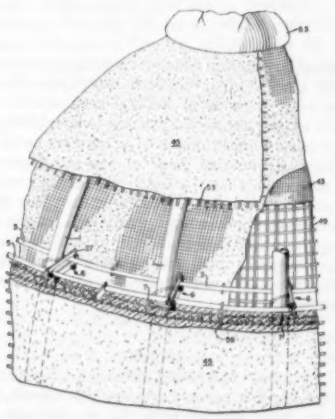
1. A honing tool comprising an elongate housing; a thrust body displaceable longitudinally in said housing, said thrust body comprising a thrust plate extending longitudinally, said thrust plate including opposed edge surfaces, said edge surfaces being inclined to said longitudinal axis of said thrust body and forming slideways; thrust members movable transversely to said longitudinal axis of said thrust body, said thrust members being arranged in pairs and each of said pairs comprising a cylinder and a piston slidable therein, each of said cylinders and pistons including an inner end, said inner ends being slotted and the closed ends of said slots forming surfaces inclined parallel to and engaged with said thrust plate edge surfaces; and arcuate shells mounted around said housing for movement radially outwardly therefrom, said shells being connected to said thrust members and being spring biased inwardly, said arcuate shells being adapted for mounting cutting devices.

4,144,680

FREE FORM BUILDING CONSTRUCTION

Thomas L. Kelly, 50 Randolph Ave., Waterbury, Conn. 06710

Filed Aug. 2, 1977, Ser. No. 821,238
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—80 **3 Claims**



1. A building structure, including in combination, a basic framework comprising a plurality of generally vertically extending spaced apart members, said members assuming any desired configuration to provide a building structure of the desired form, a plurality of pairs of laterally extending members, said pairs of laterally extending members being vertically spaced apart along said generally vertically extending mem-

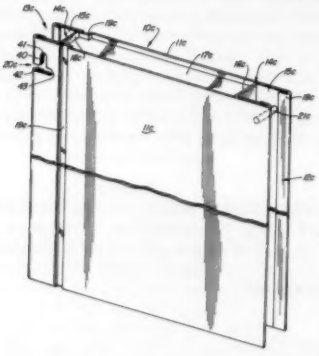
bers and said pairs of laterally extending members extending between adjacent vertically extending members, said pairs of laterally extending members extending about said building structure, means clamping each of said pairs of laterally extending members to each of said generally vertically extending members and one of said laterally extending members of a pair being clamped to said generally vertically extending members on one side thereof and the other of said pair of laterally extending members being clamped to said generally vertically extending members on the other side thereof, the said clamping means includes a half loop extending about a generally vertically extending member and includes mechanism including a half loop anchor bar, a base bar and said half loop being fastened to said half loop anchor bar and said base bar, an upper locking bar fastened to said base bar and positioned thereabove, a recess being provided by said base and upper locking bars and said laterally extending members being bedded and fastened in said recess.

4,144,681

INTERLOCKING BUILDING PANEL WITH ASSEMBLY FACILITATING HINGE

William T. Leffler, Gahanna; Bruce W. Hamler, Columbus, and Stephen R. Spriggs, Grove City, all of Ohio, assignors to United McGill Corporation, Columbus, Ohio

Filed Jan. 3, 1978, Ser. No. 866,652
Int. Cl.[2] E02D *35/00*
U.S. Cl. 52—127 **24 Claims**



1. A modular building panel comprising a structurally rigid, elongated panel having opposed, longitudinally extending, marginal edge portions of mating configuration forming a respective tongue and socket adapted to interfit edgewise with a respective socket and tongue of an adjacent panel, and hinge means formed with said panel at one end thereof enabling hinged interconnection of a panel with an adjacent panel permitting relative swinging movement in the plane of the panels into interfitting, edgewise engagement of a tongue and socket, said hinge means including a hinge pin and hinge socket with pivot axes disposed transverse to the plane of the panel and assembled by relative displacement of two adjacent panels in the same plane.

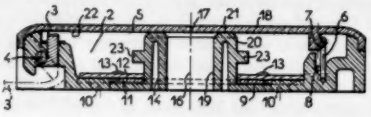
4,144,682

TOPOGRAPHIC BENCH MARK

Gilbert Cousin, 9/6, rue de La Loire, Lille (Nord), France

Filed Apr. 15, 1977, Ser. No. 787,968
Claims priority, application France, Apr. 22, 1976, 76 12483
Int. Cl.[2] L01F *9/02*
U.S. Cl. 52—103 **17 Claims**

1. A topometric bench mark unit, comprising;
a bench mark member, having disposed and marked thereon a bench mark point defining in use, a center of topometric reference system corresponding to a territory;
mounting means received on said bench mark member for mounting, in use, a topometric element on the bench mark member in a position predetermined relative to the bench mark point to permit measurements to be carried out with the topometric element, relative to said point and reference system;
a flat casing defining a space internal thereof, the case having



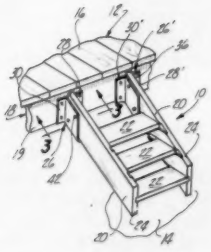
a back and having, in use, said bench mark member rigid with said back in said space, and having means for identifying the bench mark member;
a lid movably mounted on the case for providing access to the bench mark member in said space; and
support means for fixed mounting of the back of said case on a surface of a structure in the territory.

4,144,683

BRACKET ASSEMBLY

Robert O. Dean, Solvang, Calif., assignor to Spiral-Craft, Owosso, Mich.

Filed Jul. 5, 1977, Ser. No. 812,760
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—182 **14 Claims**



1. A two-part bracket assembly adapted for securing a stringer for a stairway construction to the upper of two building levels so that said stringer slopes downwardly from the upper to the lower building level at a predetermined angle comprising:
a vertical flange on each of said parts disposed substantially in a vertical plane and abutting said upper building level,
a side panel on each of said parts disposed substantially in a vertical plane and substantially perpendicular to the plane of the vertical flange whereby one panel is disposed on each side of said stringer,
a support flange extending perpendicularly outwardly from the lower depending edge of each of said side panels and underneath said stringer wherein the plane of said support flange intersects the plane of said vertical flange at said predetermined angle, and each support flange includes registering slots adapted to receive a fastener therethrough,
means for securing said vertical flanges to said upper building level so that the lower surface of said stringer abuts against at least one of said support flanges, and
each of said two parts is substantially the mirror image construction of the other part.

4,144,684
GLAZING UNIT

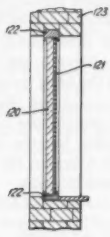
Bernard J. Kirkbride, Wigan; Robert A. Downey, Burscough; Charles V. Thomasson, Preston, and Joseph E. Lewis, Burscough, all of England, assignors to Pilkington Brothers Limited, St. Helens, England

Division of Ser. No. 585,522, Jun. 10, 1975, Pat. No. 4,019,887. This application Dec. 13, 1976, Ser. No. 749,715

Claims priority, application United Kingdom, Jun. 14, 1974, 26522/74

Int. Cl.[2] E06B *1/04, 3/24*

U.S. Cl. 52—204 **16 Claims**



1. A glazing unit having desirable solar control properties comprising a sheet of silicon coated flat glass having a substantially uniform silicon coating of optical thickness in the range 950Å to 1600Å and a refractive index in the range 3.0 to 4.0 and capable of transmitting light.

3. A glazing unit having desirable solar control properties comprising a sheet of glass having a coating of thickness in the range of 250 to 600Å and consisting essentially of silicon on a major face thereof and a frame for that sheet, said glazing unit being glazed in the opening of a wall of a building to provide a window in said wall.

11. A multiple glazing unit having desirable solar control properties comprising at least two sheets of glass spaced apart by spacer elements, at least one of sheets having a coating of thickness in the range of 250 to 600Å and consisting essentially of silicon on a major surface thereof disposed internally of the unit, said at least one sheet, when viewed from the coated side, having a white light transmission in the range 17% to 34%, a direct solar heat transmission in the range 27% to 45%, and a solar radiant reflection in the range 34% to 52%.

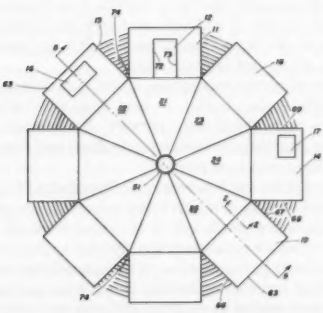
4,144,685
BUILDING CONSTRUCTION

Robert C. Fox, APDO 6721, San Jose, Costa Rica

Filed Dec. 10, 1976, Ser. No. 749,366

Int. Cl.[2] E04B *1/342;* E04C *3/26*

U.S. Cl. 52—223 R **23 Claims**



1.A method of building construction comprising the steps of:

arranging a plurality of wall-forming panels in vertical position to form a polygonal enclosure for a base;

binding said panels with elongated flexible tying members;

assembling a plurality of prefabricated base-forming sectors into a polygonal base;

aligning radially extending tubes of said sectors with tubes in said panels;

fitting the aligned tubes together at the junction of the wall-forming panels with base-forming sectors; and

filling the aligned tubes with a settable material.

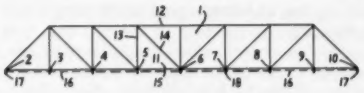
4,144,686
METALLIC BEAMS REINFORCED BY HIGHER STRENGTH METALS

William Gold, 14 Cass Pl., Brooklyn, N.Y. 11235

Continuation-in-part of Ser. No. 165,131, Jul. 22, 1971, abandoned. This application Jun. 27, 1977, Ser. No. 810,065

Int. Cl.[2] E04C *3/10*

U.S. Cl. 52—225 **24 Claims**



1. A prestressed and composite metallic beam, comprising a metallic beam, resting on two supports, a cable means and at least three anchor means, which are attached to the beam, and grip the cable means, of these anchor means, at least one interior anchor means grips the cable means, at least in part, by exerting on it pressure from a plurality of opposite directions, the cable means extends, essentially, longitudinal with respect to the beam, for at least part of the latter's length, and at least part of the cable means' length is situated adjacent to the beam's tensioned part, preferably its tensioned flange, continuously to both sides of the beam's section of maximum positive moment, the anchor means transfer to the beam the forces of the cable means, including its prestressing forces.

4,144,687
SELF-SUPPORTING GIRDER STRUCTURE

Tons J. Brunes, Attemosvej 8,, 2840 Holte, Denmark

Continuation of Ser. No. 376,128, Jul. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 157,381, Jun. 28, 1971, abandoned. This application Mar. 19, 1975, Ser. No. 560,178

Claims priority, application Denmark, Jul. 1, 1970, 3438/70

Int. Cl.[2] E04C *3/10*

U.S. Cl. 52—229 **1 Claim**

1. In combination with self-supporting linear girder structure made up of a plurality of identical, triangular, separable sections of molded plastic arranged linearly, each section having an equilateral triangular cross section transverse to said linear structure, the adjoining faces of said sections having complementary interengaging projections and recesses to prevent relative transverse movement, longitudinal openings through each section adjacent the apices of the triangular section, a metal tubular bush through each opening, so that said bushes when assembled form longitudinal passages through said girder structure, the bushes in each section being equally spaced at the apices of the triangular section and having the exact length of a section with their ends flush with the end faces of the sections, longitudinal tensioning members extend-

ing through said passages from end to end, and clamping means on the ends of said tensioning members to clamp said sections together, said clamping means placing said longitudinal members under tension and prestressing said sections, said bushes engaging to limit compression of said sections, and a pair of triangular members each having the cross section of an equilateral triangle secured to the top apices of certain sections so that one face of each of two triangular members abuts opposite faces at the top of a section to form a flat support composed of two faces of the triangular members and a conveyor supported by said structure on said two faces which form a plane parallel to the section face opposite to the top of the section.

4,144,688

FIRE RESISTANT SEALS

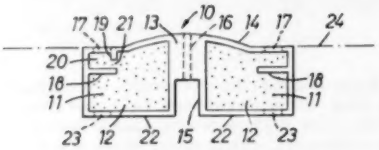
Bernard Dixon, Cambridge, England, assignor to Dixon International Limited, Cambridge, England

Filed Apr. 6, 1977, Ser. No. 785,129

Claims priority, application United Kingdom, Apr. 13, 1976, 15033/76

Int. Cl.[2] E16J *15/00*; E06B *7/16*

U.S. Cl. 52—232 **8 Claims**



1. A fire-resistant seal for application to a structure, said seal comprising a holder of substantially tubular form for securing to the structure, said holder being in the form of a hollow strip wherein said openings are formed in opposite faces thereof, said holder defining an interchamber, a fire-barrier material which swells under fire conditions being retained in the chamber, the holder having a series of external openings distributed therealong and communicating with the interior chamber, the total flow area of the openings at the outer surface of the holder being less than the total imperforate area of said outer surface, a baffle extending within the holder throughout the length thereof and between the openings and the chamber.

4,144,689

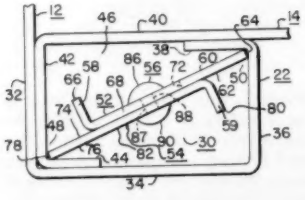
JOINT FOR INTERCONNECTING PANELS

Gurdip S. Bains, Bonneauville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1978, Ser. No. 880,538

Int. Cl.[2] E04B *2/00*

U.S. Cl. 52—285 **8 Claims**



1. A joint between adjacent panels, comprising:

first and second upstanding panel members having first and second cooperatively bent members, respectively, at adjoining vertical edges thereof,

said first and second cooperatively bent members being coupled to define a vertically extending, open-ended cavity having a substantially rectangular configuration in horizontal section, predetermined first and second opposite corners of which are formed from the first and second cooperatively bent members, respectively,

and expandable locking means disposed in said vertically extending cavity,

said expandable locking means having at least first and second relatively movable plate members defining first and second vertically extending edge portions, respectively, which extend outwardly from opposite sides of said expandable locking means, said first and second edge portions extending along substantially the complete height of said cavity adjacent to the first and second opposite corners of said substantially rectangular configuration,

said first and second edge portions increasing their spacing upon predetermined substantially vertical movement of one plate member relative to the other, to cause the first and second edges of the plate members to apply a substantially uniform pressure against the first and second opposite corners of the rectangular configuration, over substantially the complete lengths of the first and second opposite corners, to maintain the first and second panel members in assembled relation.

4,144,690

CONCRETE FORMING STRUCTURES

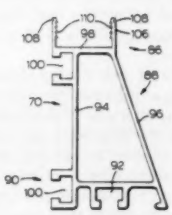
Peter J. Avery, Toronto, Canada, assignor to Aluma Building Systems Incorporated, Downsview, Canada

Filed Dec. 19, 1977, Ser. No. 862,278

The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.

Int. Cl.[2] E04H *12/34*; E04B *5/00*

U.S. Cl. 52—376 **13 Claims**



6. For use with concrete forming structures of the type employing a plurality of beams positioned to support loads exerted thereon through panels supported thereby and secured thereto; an extruded aluminum beam having a unitary structure and a constant cross-section throughout its length, and having base, web and channel portions, where;

said web portion is formed between said channel portion and said base portion substantially along the entire length of said beam so as to be able to transfer load forces from said channel portion to said base portion at any place along the length of said beam, and comprises first and second webs which are spaced laterally apart;

said channel portion comprises a first wall intersecting and generally perpendicular to said first web of said web portion, and substantially parallel channel side walls extending generally perpendicularly from said first wall and away from said web portion;

said base portion has a generally T-shaped slot formed longitudinally therein, said slot being suitable for receiving and retaining a bolt head; said T-shaped slot including a wall member which is substantially parallel to the first wall of said channel portion and a pair of parallel slot side walls extending generally perpendicularly from said wall member in a direction away from said channel portion;

wherein said first web member has a pair of spaced apart generally T-shaped slots formed longitudinally on the side thereof remote from the said second web member, where

each of said T-shaped slots is suitable for receiving and retaining a bolt head; and each of said slots has a pair of parallel slot side walls which extend generally perpendicularly from said first web member away from said second web member;

wherein said second web member diverges from said first web member in a direction towards said base portion;

wherein each of said first web member and said second web member extend beyond a base wall which comprises extensions of said first wall of said generally T-shaped slot formed in said base portion, parallel to said first wall of said channel portion;

wherein the closer slot side wall to said channel portion of the one of said T-shaped slot members which is closer to said channel portion is a portion of said first wall of said channel portion; and

where the outer edge of the outer section of each of said pair of spaced apart slots on said first web member is substantially co-planar with the outer side of one of the side walls of said channel portion of said beam.

4,144,691

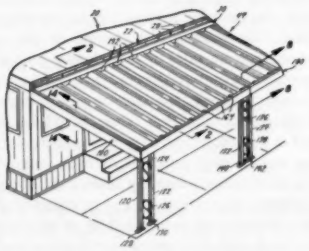
PATIO ROOF

Milo F. Hindman, #15 Evergreen, Centralia, Ill. 62801

Division of Ser. No. 702,193, Jul. 2, 1976, Pat. No. 4,077,175. This application Nov. 25, 1977, Ser. No. 854,897

Int. Cl.[2] E04B *5/52*

U.S. Cl. 52—461 **2 Claims**



1. A roof which has a plurality of elongated supporting members that are generally parallel to each other but that are spaced apart several feet, a plurality of roof pans that are made of thin gauge metal and that are supported only adjacent the ends thereof by said elongated supporting members and hence experience substantial dimensional changes under heavy loads, each of said roof pans having at least one upper portion and at least one lower portion and a plurality of upwardly-directed and downwardly-directed connecting portions which displace said one lower portion horizontally away from, and vertically below the level of, said one upper portion, the upper portions of said roof pans being spaced apart by said upwardly-directed and downwardly-directed connecting portions but coacting together to define a first substantially-planar surface for said roof, the lower portions of said roof pans being spaced apart by said upwardly-directed and downwardly-directed connecting portions but coacting together to define a substantially-planar surface for said roof which is displaced vertically below the level of said first substantially-planar surface, fasteners which secure said lower portions of said roof pans to said elongated supporting members, said lower portions of said roof pans constituting just a small portion of the overall undersurface of said roof, shallow undercut recesses in the undersurfaces of said lower portions of said roof pans which extend upwardly from said first substantially-planar surface, each of said undercut recesses having a depth which is just a small fraction of the overall height of said roof, a plurality of hangers which extend upwardly into, and which are supported by, said undercut recesses, and a plurality of sheets of material which are held by said hangers and which coact to define a ceiling for said roof.

4,144,692

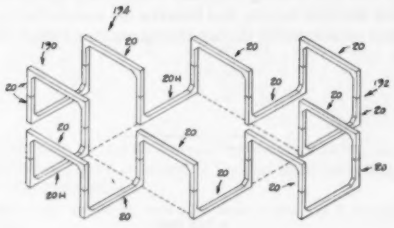
BUILDING UNIT

Gerald L. Jonas, 2217 Pacific Ave., San Francisco, Calif. 94115

Filed May 3, 1977, Ser. No. 793,281

Int. Cl.[2] E04B *1/18*; E04C *3/00*

U.S. Cl. 52—637 **15 Claims**



1. A building unit comprising a generally straight elongated portion and only one pair of generally straight, substantially parallel, spaced-apart legs extending therefrom, the legs defining respective extended ends, and means operatively associated with each end for providing that that end may be coupled to an end of another building unit, wherein the legs extend in substantially the same direction from the elongated portion; wherein each leg is positioned generally at an end of the elongated portion; wherein each of the legs is substantially rectangular in cross-section; wherein each side of each leg has an elongated groove running substantially parallel to the longitudinal axis of that leg; wherein one side of one leg faces one side of other leg; wherein the elongated grooves of the facing sides lie on the same plane, and wherein the elongated portion has an elongated continuous groove therein lying in said plane; and further comprising brace means operatively coupling the elongated portion and each leg, wherein the brace means comprise a first haunch connecting the elongated portion and one leg, and a second haunch connecting the elongated portion and the other leg.

4,144,693

FOOD PACKAGING METHOD AND APPARATUS

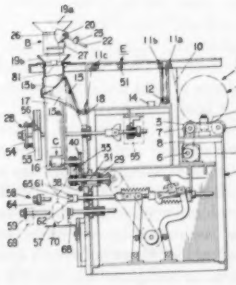
Takeru Ogata, Amagasaki, Japan, assignor to Toyo Co., Ltd., Amagasaki, Japan

Filed Jun. 15, 1977, Ser. No. 806,673

Claims priority, application Japan, Jun. 16, 1976, 51-71446

Int. Cl.[2] B65B *31/00, 9/08*

U.S. Cl. 53—433 **16 Claims**



1. A method of packaging particulate food into tubular bag-shaped enclosures formed during the performance of the method, comprising the steps of: paying out a ribbon-like, continuous film; transferring the same to forming means; imparting limited tension to the film; progressively cylindrically wrapping the continuous film about chute means for the food; vertically heat sealing an overlap on opposite lateral edges of

the wrapped film, thereby finishing it into a still continuous but tubular form; downwardly feeding the tubular film, substantially concurrently with feeding and filling the food into a food receiving region of the tubular film; forming a pair of transverse heat seals on the tubular film above the region; downwardly inching the tubular film in synchronism with said transverse heat-seal forming step; and substantially simultaneously cutting the filled tubular film between the seals to form an end product constituted by the bag-shaped enclosure filled with the food.

4,144,694

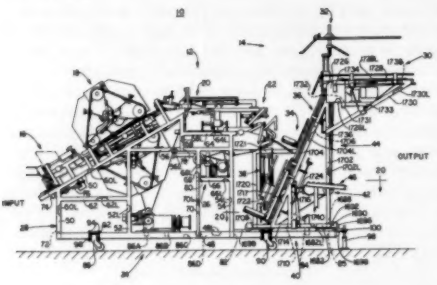
MACHINE FOR PACKING FLAT ARTICLES IN A CASE

Willis J. Stapp, Miami Township, Clermont County, and Quentin E. Honnert, Cincinnati, both of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Division of Ser. No. 714,562, Aug. 16, 1976, Pat. No. 4,064,675. This application Oct. 11, 1977, Ser. No. 841,193

Int. Cl.[2] B65B *5/10, 7/26, 57/10*

U.S. Cl. 53—52 **9 Claims**



1. In combination, a case elevator, means for supporting a case on the case elevator with an open side of the case sloping and exposed, means for directing flat articles into the case transversely of the open side to form a stack inside the case, a tongue engaging the stack as the stack increases in size, means controlled by the tongue for lowering the case as the articles are projected into the case so that the level of the upper end of the stack remains substantially constant, means for withdrawing the tongue when the stack has reached a predetermined size, a hold down and pusher member, and means for advancing the hold down and pusher member into engagement with an upper portion of the stack when the stack has reached the predetermined size to hold the articles of the stack in the case as the tongue is being withdrawn.

5. In combination, a case elevator, means for supporting a case on the case elevator with an open side of the case sloping and exposed, the case having an output flap at an upper edge of the open side, means for directing articles into the case to fill the case, a case output tipover frame, means for transferring the case to the case output tipover frame, means for swinging the case output tipover frame between a lowered position and a raised position, an elongated belt, the belt extending lengthwise of the path of the upper flap, horizontally spaced means for supporting end portions of the belt above the path of the output flap, and a weight mounted on an upper side of the belt, the weight dividing the belt into a main flap engaging portion and a support portion, the output flap engaging the belt to be folded inwardly as the case output tipover frame swings upwardly.

4,144,695

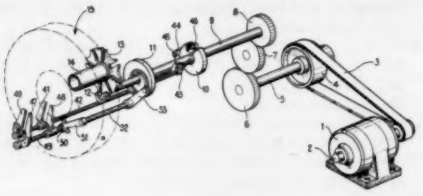
DEVICE FOR FOLDING THE HEAD PORTIONS OF INNER WRAPPERS IN A MACHINE FOR PACKETING CIGARETTES INTO HINGED-LID TYPE PACKETS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Aug. 12, 1977, Ser. No. 823,928

Int. Cl.[2] B65B *11/28, 49/08*

U.S. Cl. 53—234 **3 Claims**



1. In a machine for packeting batches of cigarettes into hinged-lid type packets, which comprises a plurality of wheels and at least one of said wheels defining radial compartments for housing respective ones of the batches of cigarettes to be wrapped in inner wrappers having an end portion, said one wheel being rotatable to position the compartments in a plurality of successive stations for folding the inner wrappers about the respective batches of cigarettes; stationary and movable folding means for folding the inner wrappers about the batches of cigarettes, the movable folding means including two pairs of folding blades for folding end portion of the wrappers and positioned at opposite sides of the wheel in one of the stations wherein successive ones of the compartments are positioned to dwell; transfer means for subsequently transferring the wrapped batches of cigarettes from the wheel to an adjacent wheel; and a kinematic driving mechanism with a stepwise device for step-by-step rotation of each one of the wheels including a continuously rotating shaft, a driving means for the movable folding means and a driving means for the transfer means, the continuously rotating shaft of said stepwise device being associated with the two pairs of folding blades; a driving cam keyed to said continuously rotating shaft; a kinematic mechanism linked to the driving cam and a rocking shaft oscillated by the kinematic mechanism, the rocking shaft being associated with the folding blades: the improvement of

(a) a rocking member pivotal about a stationary pivot and connecting the driving cam with the kinematic mechanism, the rocking member carrying at respective points spaced from the stationary pivot

(1) a cam follower cooperating with the driving cam and driven thereby and

(2) a gearing which is part of the kinematic mechanism; and

(b) another gearing on the rocking shaft forming another part of the kinematic mechanism and meshing with the gearing on the rocking member,

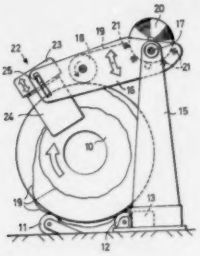
(1) the driving cam being shaped to drive the folding blades so that they sequentially carry out a first oscillating movement in a direction opposite to the direction of rotation of the wheel, a dwell, a second oscillating movement in a direction opposite to the direction of the first oscillating movement, a third oscillating movement in the same direction as the direction of the first oscillating movement, and a fourth oscillating movement in a direction of the second movement to return the folding blades to their starting position, the first movement, the dwell, the second movement and the third movement occurring during a single dwell of the wheel and the fourth movement occurring during the next movement of the wheel.

4,144,696

SHRINK WRAPPING PROCESS AND APPARATUS

Olov E. Gustavsson, Küngalv, Sweden

Filed Sep. 27, 1977, Ser. No. 837,237
Claims priority, application Sweden, Oct. 18, 1976, 7611564
Int. Cl.[2] B65B *53/02*
U.S. Cl. 53—442 12 Claims



1. In the process for forming a protecting plastic envelope around an object that is at least generally prismatic or cylindric and which has two ends and an elongated exterior surface portion extending between said two ends, said process comprising the steps of:

(A) supporting the object in a manner to permit rotation thereof with the axis of its elongated exterior surface portion lying in a substantially horizontal and approximately stationary position and with at least the radially outermost portions of its two ends free,

(B) causing the object thus supported to rotate about said axis, while

(C) winding a web of plastic film around said elongated exterior portion a plurality of times while the object is rotating so as to cover said elongated portion with a plurality of superposed layers of plastic film, and

(D) applying heat to effect shrinkage of said plastic, the improvement which comprises in combination

(1) applying a web of plastic film that is thin and which has a width greater than the length of said elongated exterior surface portion so that the plastic film will extend beyond the ends of said object,

(2) said plastic film being of the type which by being heated can be imparted adhesive properties and be caused to shrink,

(3) subjecting the full axial length of each of said plurality of layers of plastic film to heat radiation as each plastic film layer is applied to said elongated exterior surface portion, each such successive heat application extending across the entire elongated exterior or surface portion,

(4) also heat radiating the portions of said web of plastic that extend beyond said two ends so that these portions of the plastic web will shrink inwardly toward the axis of the elongated exterior surface portion,

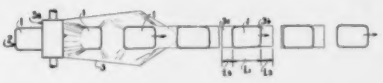
(5) the amount of heat radiation applied to each plastic film layer in accordance with step (3) being regulated to increase the temperature of each successively applied plastic film layer to an extent that its adhering and shrinking properties are released whereby adherence of each succeeding film layer to the next will be achieved during wrapping of the object, and the end portions of the film web, as a result of the shrinking of the film, will be drawn inwardly and tightened over portions of the end surfaces of the object.

4,144,697

PACKING APPARATUS

Tadoru Suga, 1-6-44, Nakahozumi, Ibaragi, Osaka, Japan

Filed Apr. 11, 1977, Ser. No. 786,431
Int. Cl.[2] B65B *9/06*
U.S. Cl. 53—556 8 Claims



1. Packaging apparatus for continuously enclosing successive articles within a covering of flexible stretchable thermoplastic film comprising:

a. conveyor means to move successive articles in a straight path;

b. a pair of endless chain means, each chain means including a plurality of fingers for successively gripping opposite margins of said film and for successively releasing said margins after enclosing an article on said conveyor with a predetermined length of said film;

c. said endless chain means be supported on respective opposite sides of said conveyor means for movement of said fingers with said articles and for movement of said fingers

1. initially in transversely divergent paths relative to each other to initiate stretching of the film prior to contact with the article;

2. to continue to move the margins in respective paths which are divergent to each other and convergent to said straight path of the articles to continue stretching of the film and to produce contact between the film and a progressively increasing area of the surface of an article;

3. to thereafter continue to move said margins in respective paths convergent to each other and divergent to said straight path to produce progressively increasing enclosing contact between the film and the surface of the article, and;

4. finally to move the respective opposite margins into contact with each other to complete the enclosing of said article;

d. sealing mechanism including means engaging opposite sides of a film covered article and a pair of opposing endless belts including heating means for sealing the opposite margins of the film together under the article to complete enclosing the article in a tubular envelope of film;

e. cutting means for severing the tubular film at locations between successive articles to provide leading and trailing tubular end portions for each article;

f. means for folding under said leading and trailing end portions comprising means for engaging opposite sides of an article to convey the article in a path away from said cutter, and;

g. means for applying heat and pressure to an area of the under side of an article to seal said end portions in place.

4,144,698

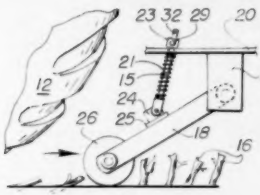
STUBBLE FLATTENER ATTACHMENT

George E. Shelton, Sullivan, Ill., assignor to Lloyd Younger, Bethany, Ill., a part interest

Filed Jan. 10, 1977, Ser. No. 758,167
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—1 6 Claims

1. A stubble flattener for attachment to the header of a combine comprising a ground wheel for said header and a pneumatic tire subject to damage by stubble, a plate adapted to be fastened to a header, a pair of arms pivotally mounted at their upper ends relative to the plate, a roller secured to the lower ends of the arms immediately in front of said tire and substantially as wide as said tire, the roller being disposed so

that it runs along the ground to flatten stubble so that it does not injure said tire, and a compression spring disposed between



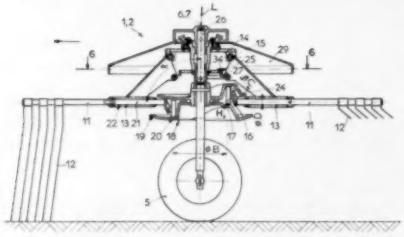
the plate and the arms for urging the roller against the ground to flatten stubble.

4,144,699

HAYMAKING MACHINE FOR TEDDING AND WINDROWING OF FODDER

Jérôme Aron, Dossenheim sur Zinsel, France, assignor to Kuhn, S.A., Saverne, France

Filed Jan. 26, 1977, Ser. No. 762,725
Claims priority, application France, Jan. 30, 1976, 76 03525
Int. Cl.[2] A01D *79/00*
U.S. Cl. 56—370 **17 Claims**



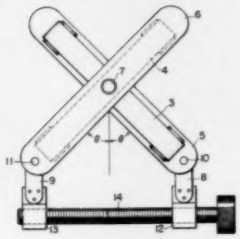
1. In a haymaking machine for the tedding and windrowing of fodder, of the type comprising one or more rake wheels driven in rotation, on which working tool-carrier arms extend outwards and are mounted for pivoting in support bearings articulatedly connected to a drive hub, each of the said working tool-carrier arms having at its inner end a control crank provided with a roller; the improvement in which the said roller (**17**) moves during work in a control cam (**18**) having two guide tracks (**19** and **20**), one of the said guide tracks being intended to guide the rollers (**17**) of the control cranks (**16**) of the tool-carrier arms (**11**) of one and the same rake wheel (**1** or **2**) during windrowing work and the other of the said guide tracks being intended to guide the said rollers (**17**) during tedding work, and in that the angle (α) formed during windrowing by the longitudinal axis (**21**) of the portion (**22**) of the tool-carrier arms (**11**) which is disposed in the support bearings (**13**), when this axis (**21**) extends in a plane (P) parallel to the direction of travel of the machine, with a plan (L) substantially perpendicular to the said direction of travel which passes through the rotation axis (**6** or **7**) of the corresponding rake wheel (**1** or **2**), is greater than the angle (β) formed during tedding by the said longitudinal axis (**21**) of the portion (**22**) of the tool-carrier arms (**11**) which is disposed in the support bearings (**13**) when this axis (**21**) extends in a plane (P) parallel to the direction of travel, with the said plane (L) substantially perpendicular to the direction of travel which passes through the rotation axis (**6** or **7**) of the corresponding rake wheel (**1** or **2**).

4,144,700

FALSE TWISTING APPARATUS

Isao Takai, Ishikawaken, and Noboru Shindo, Shigaken, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Dec. 12, 1977, Ser. No. 859,393
Claims priority, application Japan, Dec. 14, 1976, 51-150634; Dec. 14, 1976, 51-168142[U]; Dec. 14, 1976, 51-168143[U] Dec. 14, 1976, 51-168147[U];
Int. Cl.[2] D02G *1/06;* D01H *7/92*
U.S. Cl. 57—264 **19 Claims**



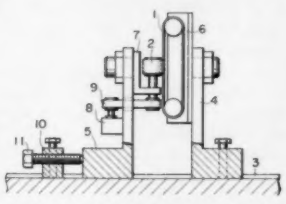
15. False twisting apparatus including a pair of endless belts intersecting centrally being driven in opposite directions with respect to the running direction of yarn passing between the belts at their point of intersection characterized by means for simultaneously adjusting the angle each belt makes with the direction of running of the yarn equally.

4,144,701

APPARATUS FOR SETTING NIP PRESSURE OF BELTS IN FALSE TWISTER

Isao Takai, Komatsushi, and Noboru Shindo, Ohmi Hachimanshi, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Dec. 12, 1977, Ser. No. 859,392
Claims priority, application Japan, Dec. 14, 1976, 51-168148[U]
Int. Cl.[2] D02G *1/06;* D01H *7/92*
U.S. Cl. 57—336 **6 Claims**



3. Structure for nipping and false twisting yarn comprising a pair of endless belts extending perpendicularly to each other and in engagement with each other centrally thereof, means driving the belts in opposite directions and adjustable means for varying the pressure between the belts at their point of contact to vary the nip pressure of yarn passed between the belts at the intersection thereof for maintaining the nip pressure at a predetermined level.

4,144,702

OPEN END SPUN SLUB YARN

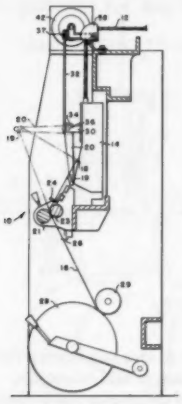
Edgar H. Pittman, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 24, 1978, Ser. No. 889,719
Int. Cl.[2] D01H *1/12;* D02G *3/34*
U.S. Cl. 57—58.89 **5 Claims**

1. The method of producing a slub open end spun yarn comprising the steps of: supplying open end spun yarn from the

exit means of an open end spinning machine to a yarn take-up roll and periodically decreasing the velocity of the yarn from the exit means to allow a build-up of fibers in the open end spinning machine to produce a slub in the subsequent yarn exiting from the open end spinning machine.

4. Apparatus to produce slub open end spun yarn comprising: a frame, a housing on said frame, means in said housing to produce open end spun yarn, an exit means in communication with said means to produce the open end spun yarn, a yarn



take-up roll means mounted on said frame, means supplying open end spun yarn from said exit means to said take-up roll means and means operably associated with said exit means to periodically decrease the velocity of the yarn from the exit means to allow a fiber build-up in said means to produce an open end spun yarn to produce a slub or thick portion in the subsequent yarn exiting from said exit means, said means to decrease the velocity of the yarn including a means to abruptly decrease the velocity of the yarn to substantially zero.

4,144,703

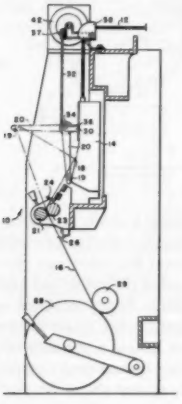
OPEN END SPUN SLUB YARN

Robert M. Ingham, Jr., Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 24, 1978, Ser. No. 889,720

Int. Cl.[2] D01H *1/12*; D02G *3/34*

U.S. Cl. 57—58.89 **2 Claims**



1. Apparatus to produce slubbed open end spun yarn comprising: a frame, a housing mounted on said frame, means to supply staple fibers into said housing, a first means in said housing to open end spin staple fibers, doff means connected to said housing and in communication with said first means, a pair of rolls in nip forming relationship mounted on said frame receiving open end spun yarn from said doff means, lever means pivotally mounted to said apparatus in the path of travel of the yarn from the doff means to said pair of rolls, means to periodically pivot said lever means upwardly to increase the path of travel of said yarn and to abrubtly pivot said lever means downwardly to momentarily decrease the yarn velocity from said doff means to substantially zero.

4,144,704

SAFETY DEVICE FOR BATTERY-OPERATED WATCHES

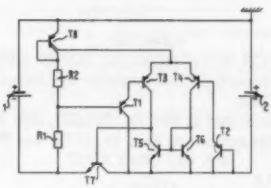
Hubert Portmann, Colombier, Switzerland, assignor to Ebauches SA, Neuchatel, Switzerland

Filed Aug. 6, 1975, Ser. No. 602,389

Claims priority, application Switzerland, Aug. 30, 1974, 11819/74

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 BA **9 Claims**



1. A safety device for battery-operated electronic watches comprising:

a battery,

an accumulator,

switch means adapted to connect said accumulator in parallel with the battery, said switch means being connected in series directly between the battery and the accumulator, and

an electronic device connected at least to the accumulator and being adapted to control said switch means in order to regulate the current delivered from said battery to said accumulator in dependence upon a predetermined voltage, the said electronic device being also adapted to drive a device indicating the end of life of the battery.

4,144,705

TIMEPIECE CIRCUIT DEVICE

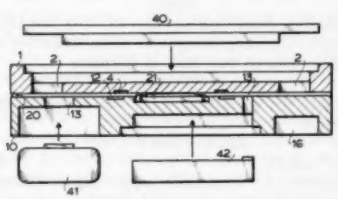
Yoshio Iinuma, Iruma, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 729,727, Oct. 5, 1976, abandoned. This application Apr. 19, 1978, Ser. No. 897,902

Claims priority, application Japan, Oct. 15, 1975, 50-140086; Oct. 16, 1975, 50-124705

Int. Cl.[2] G02F *1/13*; G04B *29/00*; G04C *3/00*

U.S. Cl. 58—52 R **6 Claims**



1. A module construction for an electronic watch comprising:

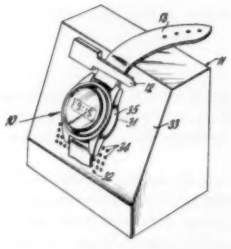
(a) a liquid crystal display cell for providing a display of time information;
(b) an integrated circuit chip for providing electric signals to drive said liquid crystal display cell;
(c) a plastic upper frame having an upper surface formed with a recess to retain said liquid crystal display cell;
(d) a plastic lower frame having an upper surface formed with a first recess to accommodate said integrated circuit chip and a lower surface formed with a second recess adapted to accommodate a battery and a plurality of third recesses adapted to accommodate electronic components therein respectively;
(e) a plurality of electrical leads interposed between said upper and lower frames and providing an electrical connection between said integrated circuit chip and said liquid crystal display cell;
(f) a bonding material connecting said lower surface of said upper frame, said leads and said upper surface of said lower frame; and
(g) a seal formed completely around said integrated circuit chip by said upper frame, said leads, said lower frame and said bonding material.

4,144,706

ALARM WATCH WITH REMOTE SONIC GENERATOR

Alan E. Willis, Stamford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 761,087, Jan. 21, 1977, abandoned. This application Dec. 16, 1977, Ser. No. 861,376
Int. Cl.[2] G04B *23/12*
U.S. Cl. 58—57.5 **8 Claims**



1. An alarm device comprising:
a watch having alarm logic circuit means for electrically generating alarm coupling signals at a selectable time,
a stand adapted to temporarily hold the watch in proximity thereto,
sensing means mounted in said stand physically separated from said watch when the watch is held on the stand but responsive to said signals, and
a sonic generator coupled to the sensing means and being activated by said signals to produce an audible sound.

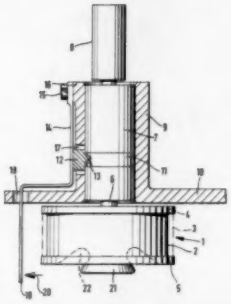
4,144,707

OPEN END SPINNING ASSEMBLY WITH AN OPENER ROLL

Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Uberkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,200
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640176
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.91 **22 Claims**

1. An assembly for detachably supporting an opener roll and opener roll shaft at an open end spinning unit or the like, comprising:
housing means defining a cylindrical receptacle,
a cylindrical bearing sleeve for rotatably supporting an opener roll shaft and opener roll, said bearing sleeve being axially movable into and out of said receptacle along with said opener roll shaft and opener roll supported thereby,
radially extending recess means in said receptacle,
radially extending depression means in said bearing sleeve,
a pressure piece movable radially in said recess means,
and an adjustable locking mechanism for adjustably holding said pressure piece against said bearing sleeve in said



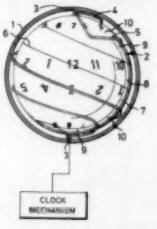
depression means to lock said bearing sleeve in a predetermined axial position in said receptacle,
wherein the shaft of the opener roll is disposed crosswise to the long direction of the spinning machine and is driven by a tangential belt that runs in the long direction of the machine, whereby the adjusting mechanism extends forward beyond the spinning assembly with its part which is actuable manually or by means of a tool, and is accessible after the opening of a cover or the like.

4,144,708

OMNIDIRECTIONAL CLOCK

David G. Jones, 74 Junction Rd., London N.19, England

Filed Jan. 24, 1977, Ser. No. 761,610
Int. Cl.[2] G04B *19/00*
U.S. Cl. 58—126 R **6 Claims**



1. A clock comprising a clock face with an annular clock face surface which extends radially outwardly and axially from each end thereof toward the other end and which is thereby viewable from any radial direction and both axial directions thereof, hour and minute hands mounted coaxially with the annular clock face surface for relative rotation with respect thereto, the clock face having a plurality of at least four regularly spaced sets of time indicia each comprising a plurality of time indicia angularly spaced about the clock surface, each of said hands extending in generally spaced parallel relationship with the clock face surface between the ends thereof and extending angularly at least 360° for indicating the hour and minutes with the clock face indicia from any radial direction and both axial directions of the clock face surface, and a clock

mechanism for rotating the hour and minute hands relative to the clock face.

4,144,709

EYED HOOK

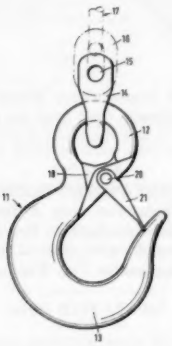
Hans Dalferth, Haydnstr. 21, 7080 Aalen-Wasseralfingen, and Reinhard Smetz, Baldinger Str. 2, 8860 Nördlingen, both of Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,829

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653664

Int. Cl.² F16G *15/04*

U.S. Cl. 59—93 **2 Claims**



1. An eyed hook with a shackle engaged in its eye, the eye having a flattened neck to allow the shackle to be engaged, while the shackle has a slot bridged over by a securing bolt, the width of the slot being greater than the width of the material of the hook constituting the neck but less than the width of the remainder of the material of the hook constituting the eye, characterised in that the neck is located where the eye merges into the hook, the neck having a transverse bore to take a locking device which also acts as a bearing for a pivoted safety catch.

4,144,710

GAS TURBINE ENGINE

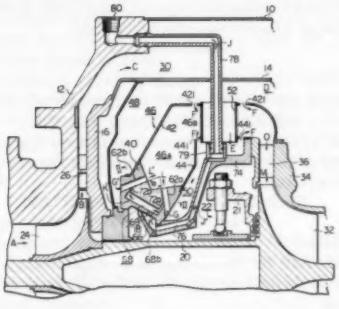
Teru Morishita, and Manabu Kazaoka, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 22, 1977, Ser. No. 809,019

Claims priority, application Japan, Apr. 15, 1977, 52-042519

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.36 **6 Claims**



1. A gas turbine engine comprising:

a housing assembly;

a shaft rotatably supported by the housing assembly;

a set of compressor blades fixed to the shaft, said housing assembly forming an air passageway of annular shape adapted for receiving a flow of air from the compressor blades;

a set of turbine blades fixed to the shaft in the housing assembly in such a way that the turbine blades are spaced apart from the compressor blades;

a combustion chamber of annular shape located inside the housing assembly, said chamber facing, on a downstream side thereof, the turbine blades so as to cause the flow of combustion gas to be directed toward the turbine blades to rotate the shaft, said chamber having, on an upstream side thereof, an annular wall adapted to isolate the combustion chamber from the annular air passageway, which annular wall defines a plurality of circumferentially spaced apart injection nozzles for communicating the air passageway with the combustion chamber so as to direct an amount of heated air from the passageway to the combustion chamber and defines a plurality of fuel nozzles which, on one end thereof, open directly into the corresponding injection nozzles, and are, on the other end thereof, opened to an annular fuel chamber formed in the circumferential direction of said wall, and;

means for introducing vaporized fuel into said annular fuel chamber so as to direct the fuel into the corresponding injection nozzles via the corresponding fuel nozzles so that a combustible mixture is formed in each injection nozzle, which mixture is ejected into the combustion chamber.

4,144,711

EXHAUST GAS PURIFYING DEVICE OF AN INTERNAL COMBUSTION ENGINE

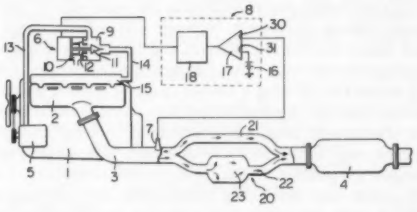
Masayoshi Tokoro, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 18, 1977, Ser. No. 779,053

Claims priority, application Japan, Dec. 7, 1976, 51-146086

Int. Cl.² F01N *3/15*

U.S. Cl. 60—276 **4 Claims**



1. In an exhaust gas purifying device for an internal combustion engine having a cylinder, an intake passage and an exhaust passage, air-fuel mixture forming means for feeding an air-fuel mixture into the cylinder of the engine, a catalytic converter in said exhaust passage having a three way catalyzer therein, said converter having an inlet, an air-fuel ratio detector in said exhaust passage upstream of said catalytic converter for producing a control signal indicating whether the total air-fuel ratio at the detecting position of the air-fuel ratio detector is larger or smaller than the stoichiometric air-fuel ratio, means for controlling the amount of secondary air fed into said exhaust passage in response to the signal produced by the air-fuel ratio detector to make the total air-fuel ratio detected by the air-fuel ratio detector change toward being equal to the stoichiometric air-fuel ratio, the improvement comprising means for producing a total air-fuel ratio at the inlet of the catalytic converter substantially equal to the stoichiometric air-fuel ratio, said producing means comprising a mixing device in said exhaust passage between said air-fuel ratio detector and said catalytic converter for mixing the exhaust gas, said mixing device having two paths for exhaust gas therethrough and

being so constructed that the difference between the length of time during which the exhaust gas passes through one of said exhaust paths and the length of time during which the exhaust gas passes through the other of said exhaust paths is substantially equal to half of one time period of the fluctuation of the total air-fuel ratio in said exhaust passage.

4,144,712

HYDRAULIC STEERING DEVICE

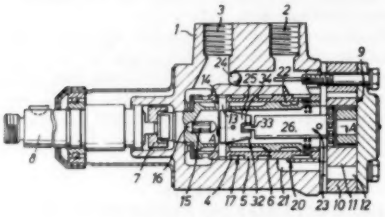
Paul E. Termansen, Sonderborg, Denmark, assignor to Danfoss A/S, Denmark

Filed Aug. 12, 1977, Ser. No. 823,924

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637332

Int. Cl.[2] F15B 9/08; B62D 5/06

U.S. Cl. 60—384 **5 Claims**



1. A hydraulic steering device, comprising, a casing having fluid passages and inlet and outlet ports, a metering motor having an inner toothed wheel attached to said casing and an eccentrically and an inner positioned outer toothed wheel with one fewer teeth having rotatable and orbital movement relative to said inner toothed wheel, said toothed wheels intermesh to form expanding chambers on one side of the line of eccentricity and contracting chambers on the other side of said line during relative movement between said wheels, inner and outer rotary distributing valves in said casing, a steering wheel coupling for said outer valve, lost motion drive means between said valves for allowing a limited range of relative movement between said valves which includes a neutral position between two changeover positions, a cardan drive shaft connected between said inner valve and said inner wheel, lost motion emergency operation clutch means between opposite ends of said cardan shaft presenting substantially more turning resistance in both directions than said lost motion drive means between said valves, said clutch means allowing a sufficient relative displacement between said inner valve and said inner wheel to provide an out-of-phase condition wherein fluid from said inlet port is drawn into both expanding and contracting chambers to substantially reduce the feed volume and consequently the steering forces to be applied.

4,144,713

PATIENT LIFTING DEVICE

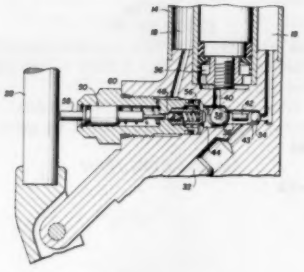
Raymond Clark, Pewaukee, and William T. Neill, Jr., Brookfield, both of Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Jul. 8, 1977, Ser. No. 814,095

Int. Cl.[2] F15B 15/18

U.S. Cl. 60—477 **22 Claims**

22. A fluid motor comprising a hydraulic ram which can be supplied with hydraulic fluid from a reservoir by means of a pump operable manully by a pump handle, said motor comprising valve means operable by more-than-normal motion of the



pump handle in its non-working direction, which motion causes release of hydraulic fluid from the ram.

4,144,714

ROTARY POWER ELEMENT

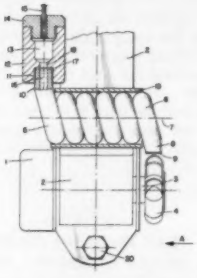
Hellmut Bendler, Fürth, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,441

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644315

Int. Cl.[2] F01B 29/00

U.S. Cl. 60—632 **14 Claims**



1. A rotary power mechanism comprising a rotary drive element, a compressed gas generator, and a liquid for actuation of said drive element, characterized in that a pipe is provided, said pipe having a first sealed discharge end and second end in communication with said compressed gas generator, said liquid being contained within said pipe, and said rotary drive element being located adjacent said discharge end.

4,144,715

METHOD OF PRODUCING MECHANICAL ENERGY FROM GEOTHERMAL FLUIDS

Raymond N. Fleck, West Covina, and Harvey Hennig, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Aug. 24, 1977, Ser. No. 827,237

Int. Cl.[2] F03G 7/00

U.S. Cl. 60—641 **20 Claims**

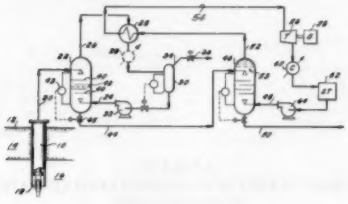
1. A method for producing mechanical energy from the recoverable thermal energy of a hot geothermal fluid, which comprises:

producing hot geothermal fluid from a subterranean geothermal reservoir;

contacting at least a portion of said hot geothermal fluid in an initial contact step with a heat transfer fluid which is substantially immiscible with said geothermal fluid,

thereby transferring a significant portion of said thermal energy to said heat transfer fluid and partially-cooling said geothermal fluid;

thereafter contacting the partially-cooled geothermal fluid in a second contact step with a working fluid which is substantially immiscible with said geothermal fluid, thereby transferring the remainder of said recoverable thermal energy to said working fluid;



further heating said working fluid by indirect heat exchange with said heat transfer fluid through a heat exchange surface; and

utilizing the heated working fluid in a heat engine to produce mechanical energy;

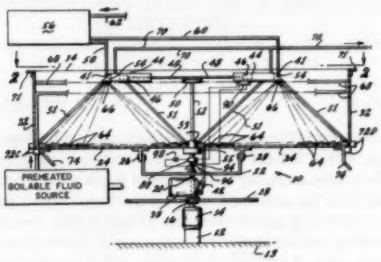
whereby the amount of geothermal fluid introduced into the heat engine and contacted with said heat exchange surface is minimized.

4,144,716

SOLAR POWERED ENGINE AND TRACKING SYSTEM

Edsel Chromie, 6720 Belle Glade, San Diego, Calif. 92119

Filed Oct. 26, 1976, Ser. No. 735,593
Int. Cl.² F03G *7/02*
U.S. Cl. 60—641 **7 Claims**



1. A solar light energy powered engine comprising:

a cylinder having a piston slidably engaged therein, said piston forming a pressure seal with the inner walls of said cylinder interconnected to a drive shaft for providing rotational forces thereto;

a flash boiler is provided at one end of said cylinder, said flash boiler having at least one flat surface;

a solar light energy concentrator comprising a plurality of recti-linear reflective surfaces supported on a substantially flat base member for concentrating solar light energy on a single focal point that comprises substantially the entire area of said flat surface of said flash boiler;

a source of pre-heated boilable fluid;

a pump injector means for selectively admitting a predetermined quantity of pre-heated boilable fluid from said source into said flash boiler adjacent said focal point at an elevated pressure;

valve means for selectively venting said cylinder of said boilable fluid; and

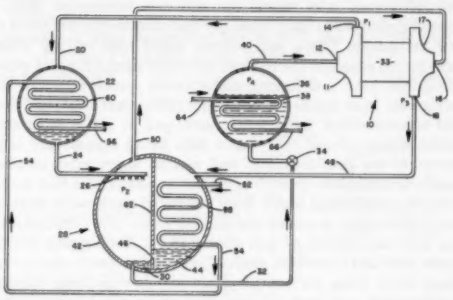
said solar light energy engine is substantially contained within a solar energy collector which pre-heats the boilable fluid from said source.

4,144,717

DUAL FLASH ECONOMIZER REFRIGERATION SYSTEM

Carl M. Anderson, Syracuse, and Louis H. Leonard, DeWitt, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,458
Int. Cl.² F25B *5/00, 31/00, 1/10*
U.S. Cl. 62—117 **15 Claims**



11. A method of cooling a fluid within a refrigeration system utilizing a refrigerant which comprises:

compressing the gaseous refrigerant to increase its temperature and pressure;

condensing the gaseous refrigerant to a liquid refrigerant;

flashing the refrigerant so that part of the liquid refrigerant changes from a liquid to a gas absorbing heat from the remaining liquid refrigerant;

recompressing the gaseous refrigerant created by the step of flashing;

recondensing the recompressed refrigerant;

reflashing the recondensed refrigerant so that part of the recondensed refrigerant changes state to a gas absorbing heat from the remaining liquid refrigerant;

lowering the pressure of the liquid refrigerant below the pressure at the steps of flashing and reflashing;

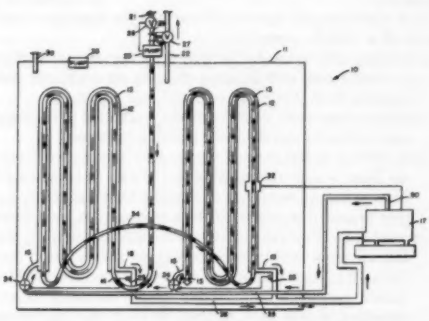
evaporating the liquid refrigerant in a heat exchanger to absorb heat from the liquid to be cooled, wherein the refrigerant changes state to a gas so it may be cycled to the step of compressing.

4,144,718

REFRIGERATION SYSTEM

Alea Williams, 1930 Asbury, Evanston, Ill. 60201

Filed Mar. 24, 1977, Ser. No. 780,777
Int. Cl.² F25D *17/02*
U.S. Cl. 62—180 **3 Claims**



1. A refrigeration system for chilling a circulating water supply for reuse in cooling industrial equipment, wherein the improvement comprises a water container, two coiled refrigerant tubes disposed within said container below the normal

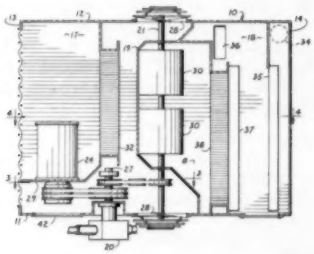
water level therein, said refrigerant tubes each having refrigerant inlet means at one end thereof for receiving refrigerant from a condenser and each having refrigerant outlet means at the opposite end thereof for discharging the refrigerant to a compressor, a first coiled water tube coaxially disposed within one of said coiled refrigerant tubes, said first water tube having water inlet means adjacent the refrigerant outlet means for said one refrigerant tube and having water outlet means adjacent the refrigerant inlet means for said one refrigerant tube, a second coiled water tube coaxially disposed within the other of said refrigerant tubes, said second water tube having water inlet means adjacent the refrigerant outlet means for said other refrigerant tube and having water outlet means adjacent the refrigerant inlet means for said other refrigerant tube, said first and second water tubes being arranged in series with said outlet means of said first water tube being operatively connected to the inlet means of said second water tube, conduit means communicating with said inlet means of said first water tube for conducting water from industrial equipment thereto, said water outlet means of said second water tube communicating with the interior of said container for discharging chilled water into said container, each of said coiled water and refrigerant tubes being formed of a material having high thermal conductivity and each of said first and second water tubes having a substantially smaller outside diameter than the inside diameter of the refrigerant tube extending thereabout, and pump means for pumping chilled water from said container to industrial equipment and for directing water from said equipment to said conduit means.

4,144,719

AIR CONDITIONING APPARATUS

Ronald L. Williams, and Robert G. McKeen, both of Dayton, Wash., assignors to Skyline Parts, Inc., Dayton, Wash.

Filed Jan. 25, 1978, Ser. No. 872,040
Int. Cl.[2] B60H *3/04*; F25D *23/12*
U.S. Cl. 62—239 **5 Claims**



1. A roof-mounted air conditioner unit for heating or cooling a cab of a vehicle, comprising:

a housing adapted to be fixed to the exterior roof surface of a vehicle cab, said housing defining an enclosure having upright front, back and opposed side walls;

a central transverse shaft rotatably journalled in the housing and extending between the side walls thereof;

first blower means located within said housing for directing air from within the housing to the cab interior, said first blower means including a rotatable blade assembly coaxially mounted to said shaft intermediate the ends thereof;

second blower means located within said housing for directing air from within the housing to the exterior thereof through at least one of said side walls, said second blower means including a rotatable blade assembly coaxially mounted to said shaft adjacent at least one end thereof;

solid interior transverse partition means fixed within said housing for isolating said first blower means from said second blower means;

a compressor mounted within said housing, said compressor having a transverse drive shaft;

motor means mounted to said housing and having a transverse driven shaft;

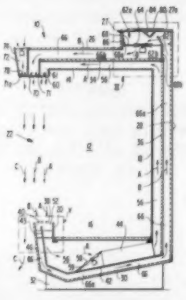
and motion transmitting means cooperatively coupled between the driven shaft of said motor means, said central transverse shaft, and said drive shaft of said compressor for rotating said central shaft and compressor during operation of the unit.

4,144,720

AIR DEFROST SYSTEM USING SECONDARY AIR BAND COMPONENTS

Elmer J. Subera, Cassopolis, and Melvin W. Steelman, Niles, both of Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Filed Apr. 25, 1977, Ser. No. 790,654
Int. Cl.[2] A47F *3/04*
U.S. Cl. 62—256 **42 Claims**



1. In an upright refrigerated display cabinet having a top, a bottom, a rear, a front side, and an access opening in said frost side for communicating a storage and display space within the cabinet with the ambient atmosphere, adjacent inner and outer outlets extending across one edge of said access opening; corresponding adjacent inner and outer inlets extending across the opposite edge of said access opening; a first conduit extending from said inner inlet around said cabinet to said inner outlet; a second conduit extending from said outer inlet around said cabinet to said outer outlet; refrigeration coil means in said first conduit; and first air circulating fan means in said first conduit for propelling air across said coil means, to said inner outlet, and across said access opening in the form of a primary air curtain to said inner inlet; the improvement comprising: air flow directing means, including second air circulating fan means, for directing the flow of air through said second conduit in a first direction during the refrigeration cycle and in a second direction, substantially opposite said first direction, during the defrost cycle whereby during the defrost cycle ambient air is selectively drawn into said second conduit outlet; and

means for diverting air from said second conduit to said first conduit during the defrost cycle and for substantially preventing the diversion of air from said second conduit to said first conduit during the refrigeration cycle;

wherein the flow of air through said first conduit is maintained continuously in the same direction to maintain a substantially continuous primary air curtain during both the refrigeration and defrost cycles.

4,144,721

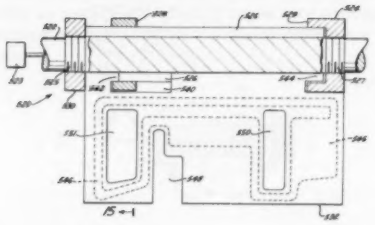
ROTARY THERMODYNAMIC APPARATUS

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Division of Ser. No. 461,452, Apr. 16, 1974, which is a division of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828, which is a continuation-in-part of Ser. No. 608,323, Jan. 10, 1967, Pat. No. 3,470,704. This application Sep. 16, 1976, Ser. No. 723,715

Int. Cl.[2] F25D *23/00, 31/00*

U.S. Cl. 62—298 4 Claims



1. Thermodynamic apparatus comprising, in combination, a spindle, and a plurality of self-contained closed-loop heat pump means for transporting heat from a first reservoir of lower temperature to a second reservoir having a relatively higher temperature than said first reservoir, said heat pump means each being attached to said spindle and extending radially from said spindle in a pattern rotationally balanced with respect to said spindle, said heat pump means each being blade-shaped, extending generally longitudinally along the spindle, and means for selectively securing a variable plurality of said blade-shaped heat pump means to said spindle.

4,144,722

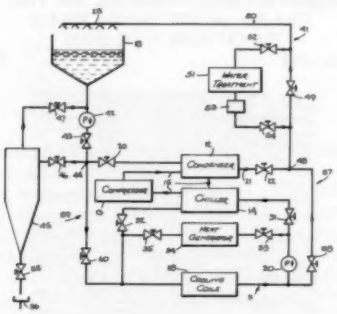
AIR CONDITIONING SYSTEM WITH SIDE STREAM FILTERING

Michael O. Mattwell, 1 Daniel Dr., Glen Cove, N.Y. 11542

Filed Apr. 11, 1977, Ser. No. 786,181

Int. Cl.[2] F28D *5/00*

U.S. Cl. 62—305 18 Claims



1. An air conditioning system in which condenser, compressor, chiller type refrigeration means is interposed between an open condenser water circuit and a closed heat exchange water circuit, and a plurality of valve controlled shunt water circuits interconnect said open water circuit with said closed water circuit for selectively bypassing said refrigeration means and passing water between said open and closed water circuits, characterized in that a water pump is disposed in said open water circuit, and a side stream filtering device is connected in a separate circuit in shunt with said pump independent of said closed water circuit.

4,144,723

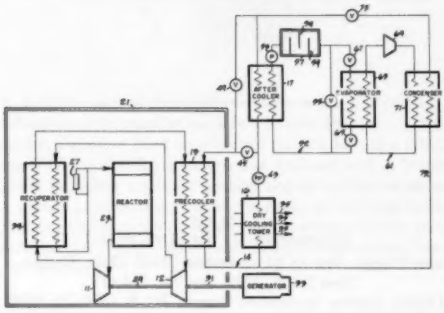
POWER PLANT SECONDARY COOLANT CIRCUIT

David C. Morse, La Jolla, and Daniel L. Vrable, San Diego, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 666,598, Mar. 15, 1976, abandoned. This application Jan. 6, 1977, Ser. No. 757,450

Int. Cl.[2] F25B *25/00, 7/00, 1/00, 1/10*

U.S. Cl. 62—332 16 Claims



1. In a power plant having heat removal means in a working fluid circuit, a closed loop primary coolant circuit for circulating a coolant through said heat removal means, said primary coolant circuit including a primary heat exchanger for cooling and coolant therein, a secondary heat exchanger, and adjustable means for selectively directing at least a portion of a primary coolant in said primary coolant circuit through said secondary heat exchanger for further cooling the primary coolant and thereby increasing heat rejection capacity of said primary heat exchanger and said closed loop primary coolant circuit.

4,144,724

UNIVERSAL JOINT

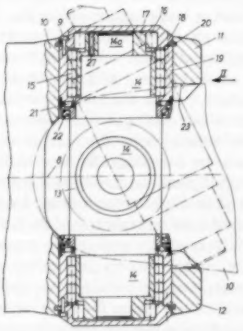
Waldemar Armasow, and Hans Lindenthal, both of Heidenheim, Fed. Rep. of Germany, assignors to Voith Transmit GmbH, Fed. Rep. of Germany

Filed May 20, 1977, Ser. No. 798,841

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2625960

Int. Cl.[2] F16D *3/30, 3/41*

U.S. Cl. 64—17 A 11 Claims



1. A universal joint, including a joint fork comprised of two spaced apart fork lugs placed radially away from the rotation

axis of said universal joint; a passage in each said lug for receiving a respective crosspin;

a crosspiece extending between said lugs; said crosspiece including a respective crosspin thereon for being received in said passage of each said lug; each said crosspin including a stepped, narrow diameter section radially further out said crosspiece and a stepped wider diameter section radially nearer said joint axis;

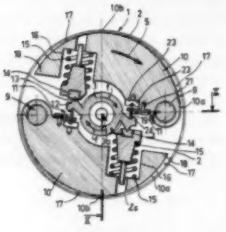
in said lug passage are positioned, generally juxtaposed and coaxial, cylindrical roller bearings having parallel axes of rotation, where one said bearing bears on said crosspin narrower diameter section and a second said bearing bears on said crosspin wider diameter section.

4,144,725

CENTRIFUGAL REGULATOR

Lucien Trappo, Rue du 11 novembre, 38640 Claix, France

Filed Jul. 8, 1977, Ser. No. 814,089
Claims priority, application France, Jul. 9, 1976, 76 21041
Int. Cl.[2] F16D *5/00;* **G01P** *3/26;* **F16D** *23/10*
U.S. Cl. 64—25 **9 Claims**



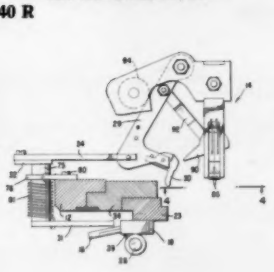
1. A centrifugal regulator comprising a drive shaft, a driven shaft in at least approximate axial alignment with said drive shaft, a hub fixed on said driven shaft, an annular casing surrounding said hub, said casing having a peripheral wall and two end walls, sealing means providing a fluid-tight seal between said casing and said hub while permitting angular movement between said casing and said hub, two spindles provided in said casing parallel to and spaced from the axis of said hub, said spindles having end portions projecting from one end of said casing, two chambers inside said casing and pivotally mounted on said spindle, said hub having two projecting arms, spring means acting between said arms and said chambers to bias said chambers toward the peripheral wall of said casing, mercury sealed in said casing, said chambers having a density less than that of mercury, whereby upon rotation of said casing the mercury acts by centrifugal force to move said chambers radially inwardly against the bias of said spring means, double edge knife blades acting between v-shaped seats on said chambers and v-shaped seats on said arms of the hub to turn said hub angularly with respect to said casing when said chambers move inwardly, means flexibly supporting said knife blades between said seats, a collar on said drive shaft, a rocking lever rotatable on said collar, means for securing said rocking lever to said collar and drive shaft in adjusted angular position and means connecting said rocking lever with said projecting end portions of said spindles and thereby coupling said casing adjustably with said drive shaft.

4,144,726

WIPER CONTROL MECHANISM FOR A CIRCULAR KNITTING MACHINE

Lester Mishcon, deceased, late of Miami Beach, Fla. by Martha Mishcon, executrix, and Harry Agulnek, Miami Beach, Fla., assignors to Vanguard Supreme Machine Corp., Monroe, N.C.

Filed Sep. 14, 1977, Ser. No. 833,197
Int. Cl.[2] D04B *15/60*
U.S. Cl. 66—140 R **3 Claims**



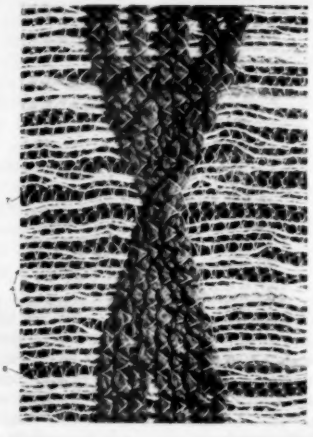
1. In a circular knitting machine, the combination comprising a striping box and an associated yarn cutting and clamping device including clamps and a wiper finger, linkage means operably connected to said wiper finger for at times moving said wiper finger inwardly and through said clamps, a pivoted cam rotatable relative to said linkage means, first cam means for disposing said pivoted cam in an actuating position to operate said linkage means and thereby cause said wiper finger to be moved inwardly and through said clamps, a pivoted link supporting said first cam means on one end thereof, and means operable with the other end of said pivoted link for moving said first cam means and to thereby move said pivoted cam into said actuating position, spring means for causing said wiper finger to be moved outwardly and over said clamps, and second cam means for causing said pivoted cam to move into a non-actuating position wherein said linkage means is not operated by said pivoted cam.

4,144,727

KNITTED MALIMO TYPE FABRIC

Daniel Duhl, New York, N.Y., and Denton B. Wall, Tarboro, N.C., assignors to Polylok Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,874
Int. Cl.[2] D04B *23/08, 23/10*
U.S. Cl. 66—192 **25 Claims**



1. In a fabric made on a stitch-through type machine such as

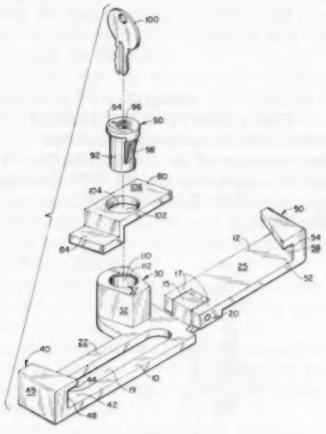
a Malimo machine, including a flexible substrate at least two yarn design elements laid on the substrate in the warp direction, and knitting thread forming a multiplicity of warpwise loop chains which bind together into an integrated structure the substrate and the design elements and to secure the substrate and design elements against relative displacement, the improvement in combination therewith wherein one or more of said design elements in one position cross over on top of one or more adjacent design elements and, in a second position, cross back over said one or more adjacent design elements for providing an aesthetically pleasing appearance corresponding to a twisted configuration of said design elements at spaced intervals.

4,144,728

SKI LOCK

Rudy C. Boynton, 517 Davenport Ct., Sunnyvale, Calif. 94087, and Ronald A. Witherspoon, 20151 Cherry La., Saratoga, Calif. 95070

Filed Apr. 10, 1978, Ser. No. 894,667
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—58 **8 Claims**



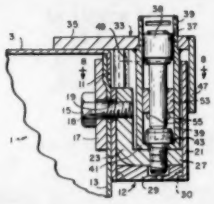
1. A device for maintaining a pair of skis in a crossed overlying relationship to each other at a predetermined angle comprising: a wedge-shaped member having first and second, relatively convergent surfaces at said predetermined angle relative to each other, said surfaces adapted to abut, respectively, a first side margin of the first of said pair of skis and a first side margin of the second of said pair of skis; means coupled to said member for preventing lateral movement of said first side margins of said first and second skis in a first direction away from said member; means spaced from said member for preventing movement of said first side margins of said first and said second skis in a second direction perpendicular to the first direction; a plate removably carried by said member and extending laterally beyond said first and second surfaces, whereby said plate overlies said first side margins of said first and second skis when the skis are in crossed positions relative to each other and when the first side margins of the skis extend along and are generally contiguous to respective surfaces of the member; and means coupled with the plate for releasably locking said plate to said member with said first side.

4,144,729

ELECTRIC METER BOX LOCK

Anker J. Nielsen, Jr., 410 Bailey Rd., Holden, Mass. 01520

Filed Mar. 29, 1978, Ser. No. 891,189
Int. Cl.[2] E05B *65/52*
U.S. Cl. 70—63 **5 Claims**



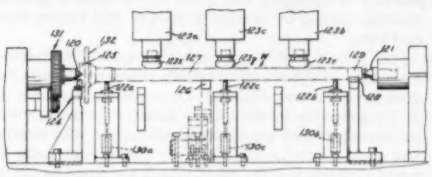
1. Locking means for electric meter boxes comprising in combination a rectangular metal box to hold the meter, a cover therefor, a bracket fixed on a wall of the box having a tubular portion of angular cross-section and a closed end, a locking element including a tubular portion also of angular cross-section mating in telescoping manner with the bracket and having a portion overlying the cover, and also having a sleeve entering the tubular bracket, and means fixing the sleeve detachably to the bracket.

4,144,730

PRODUCTION WORKPIECE STRAIGHTENING SYSTEM

Edward E. Judge, Jr., Lansing, Mich., assignor to Industrial Metal Products Corporation, Lansing, Mich.

Filed Feb. 6, 1978, Ser. No. 875,384
Int. Cl.[2] B21D *3/16*
U.S. Cl. 72—12 **24 Claims**



1. A system for straightening production quantities of a workpiece comprising;

a straightening machine having a fixed frame,

means for positioning said workpiece in precise orientation relative to said frame,

automatic means for gauging the magnitude of any distortion in said workpiece which may require correction,

automatic power operated means for deflecting said workpiece beyond yield point in a plane and direction required for correction of said distortion,

said means for deflecting having a controllable stroke potentially sufficient to eliminate said distortion in said plane within production tolerance requirements in a single deflection of required magnitude followed by springback,

and control means including,

means for storing gauged data relative to the magnitude of distortion, and

programmable means for controlling the stroke of said means for deflecting to produce programmed correction deflection of a magnitude varying with and responsive to the magnitude of gauged distortion.

4,144,731
MACHINE FOR FLATTENING SHEET METAL

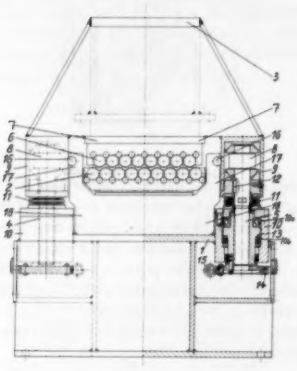
Josef Ihle, Pforzheim, Fed. Rep. of Germany, assignor to Irma Ungerer geb. Dollinger, Pforzheim, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,425

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716921

Int. Cl.² B21D *1/02*

U.S. Cl. 72—165 **8 Claims**



1. A machine for flattening sheet metal, comprising

a machine frame,

a plurality of horizontal lower rolls rotatably mounted in said machine frame,

a plurality of nuts which are carried by said machine frame and axially retained and are rotatable on respective vertical axes, which are horizontally spaced apart in the longitudinal direction of said lower rolls and in a direction which is transverse to said longitudinal direction,

a plurality of screws, which are in threaded engagement with respective ones of said nuts,

a plurality of upwardly and downwardly convex spherical bearings carried by respective ones of said screws above said nuts,

an upper yoke assembly comprising an upper yoke member, a plurality of upper rolls rotatably mounted in said upper yoke member and disposed above said lower rolls and defining nips therewith, and a plurality of concave spherical bearings which are rigid with said upper yoke member, and each of which has upwardly and downwardly disposed concave bearing faces, which are respectively disposed below and above one of said convex bearings and engageable therewith,

spring means urging said upwardly disposed concave bearings upwardly relative to said convex bearings, and

actuating means for rotating said nuts relative to said screws.

4,144,732
METHOD AND APPARATUS FOR FORMING ONE-PIECE PULLEYS

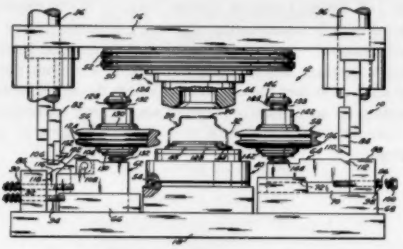
Gerald M. Franks, Dearborn, and John W. Haswell, Belleville, both of Mich., assignors to Master Craft Engineering, Inc., Tifton, Ga.

Filed Nov. 9, 1977, Ser. No. 849,986

Int. Cl.² B21H *1/00*

U.S. Cl. 72—84 **7 Claims**

1. A machine for forming a pulley having a plurality of pulley grooves of given cross section from a pulley blank in the form of a cup, each groove being defined by pulley wall means connected to the root of the groove and each groove being separated from an adjacent groove by a land, comprising axially movable members for engaging said blank adjacent opposed axial ends thereof, means to axially advance at least one of said axially movable members toward the other to a final apposition at which they define a portion of a die cavity, roll die means including at least one forming roll translatable toward the longitudinal axis and outer sidewall of the cup, said forming roll having a periphery adapted to roll form the periphery to a desired configuration, supporting means on one of said axially movable members to support the open mouth of the cup during the forming operation, the interior of said cup being unsupported by mandrel means at east at said land during all stages of the forming operation.



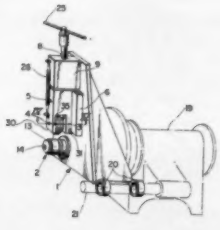
4,144,733
PIPE GROOVING APPARATUS

Billy L. Whitten, Rte. 5, LaFayette, Ga. 30728

Continuation-in-part of Ser. No. 836,933, Sep. 27, 1977, abandoned. This application Oct. 28, 1977, Ser. No. 846,538

Int. Cl.² B21D *37/04*

U.S. Cl. 72—105 **9 Claims**



1. A portable pipe grooving apparatus comprising frame means, grooving means mounted to said frame means and including a pair of mating rollers, said rollers being radially adjustable with respect to each other, one of said rollers being connected to rotatable shaft means, said shaft means extending rearwardly from said apparatus for coupling said one roller to a drive means removably associable with said shaft means for rotatively driving said one roller, coupling means for detachably connecting said frame means to said drive means, said coupling means including socket means on said frame for slideably receiving projections carried by said drive means, said socket means being sleeves fixed to said frame means as lowermost and outermost portions thereof so as to form supporting legs for said frame means and wherein said drive means is a multi-purpose power machine having a chuck, said shaft means being slidably receivable within said chuck when said projections are slid within said socket means.

4,144,734

INDIRECT EXTRUSION PROCESS AND APPARATUS

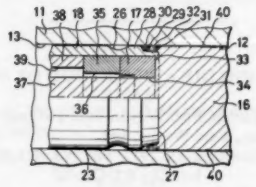
Jintaro Ishiba, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 1, 1977, Ser. No. 773,147

Claims priority, application Japan, Mar. 1, 1976, 51-21954

Int. Cl.[2] B21C *26/00, 35/04*

U.S. Cl. 72—253 A **1 Claim**



1. An indirect extrusion process utilizing a ram confronting a support, a die holder rigidly fixed at one end to the support and a container having a through-bore defined by an inner surface, the die holder supporting an orificed die within the other end and having a peripheral surface around the die with a close sliding fit with said inner surface, there being an annular step portion in the die holder adjacent to said other end, comprising the steps of:

a. loading a billet in the bore;

b. inserting said other end of the die holder into the bore;

c. actuating the ram to engage the billet and to move the container to slide over the die holder so as to extrude the billet through the die orifice;

d. simultaneously with the moving step, collecting impurities originating from the surface of the original billet and deposited between said inner surface and the extruded part of the billet, and passing in radially spaced relation to the die, as an annular butt around the annular step portion and trapped thereby out of any engagement with the die;

e. Thereafter moving the container toward the support until a butt end of the billet, joined to an extruded product and the annular butt, projects beyond an end of said container;

f. cutting off said butt end;

g. moving the container further toward the support until the annular butt projects beyond the container end and thus expands a bit radially;

h. moving the container away from the support while also withdrawing the distal end of the die holder and the die into the container, thus leaving only said annular butt on the container end; and

i. removing said annular butt from the container.

4,144,735

MOUNTING FOR THE EXCHANGEABLE SETS OF EXPANDING ELEMENTS OF TOOLS FOR ENLARGING THE ENDS OF PIPES

Günter Rothenberger, Bad Homburg-Dornholzhausen, Fed. Rep. of Germany, assignor to Rothenberger GmbH & Co. Werkzeuge-Maschinen KG Frankfurt am Main, Fed. Rep. of Germany

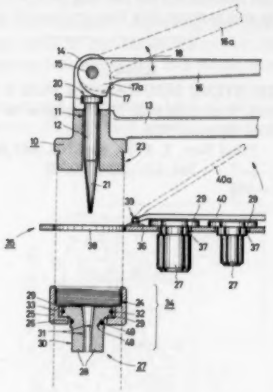
Filed Jan. 30, 1978, Ser. No. 873,588

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704638; Nov. 4, 1977, 2749345

Int. Cl.[2] B21D *39/08*

U.S. Cl. 72—393 **13 Claims**

1. A device for mounting exchangeable flanged sets of expanding elements on a tool for enlarging the ends of pipes which tool comprises a tool body having an expanding mandrel and a removable cap for retaining the sets of elements on the mandrel, the device comprising a carrier having a plurality of orifices each for the insertion of one set of expanding elements, means for removably mounting the carrier on the tool



body and means for releasably retaining the sets of expanding elements in the orifices.

4,144,736

DIE FORGING PRESS

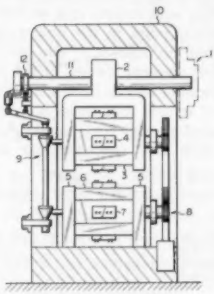
Eiichi Honda, Osaka, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Oct. 6, 1977, Ser. No. 840,004

Claims priority, application Japan, Oct. 30, 1976, 51-130611; Oct. 30, 1976, 51-130612; Oct. 30, 1976, 51-130613

Int. Cl.[2] B21J *9/10*

U.S. Cl. 72—404 **9 Claims**



1. A die forging press, comprising:

a frame;

forging load generating means

a ram connected to said means;

a top die bolster having a polygonal section and supported rotatably on said ram;

top dies mounted on predetermined faces respectively of said top die bolster;

a stationary holder fixed to the lower portion of said frame;

a bottom die bolster having a polygonal section and supported rotatably on said stationary holder, said bottom die bolster further having faces opposable to predetermined faces respectively of said top die bolster;

bottom dies mounted on predetermined faces respectively of said bottom die bolster, said bottom dies being paired with said top dies respectively;

a bolster rotating and driving mechanism for rotating said top and bottom die bolsters through a predetermined

angle simultaneously and intermittently in the same direction; and

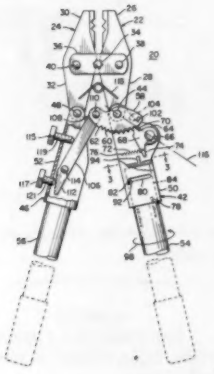
a knock-out mechanism for moving pins provided slidably in said top and bottom dies into and out of said dies.

4,144,737

ADJUSTING MECHANISM FOR A TOOL

Hyman Izraeli, West Caldwell, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Nov. 1, 1977, Ser. No. 847,545
Int. Cl.[2] B21D *9/08*
U.S. Cl. 72—409 **16 Claims**



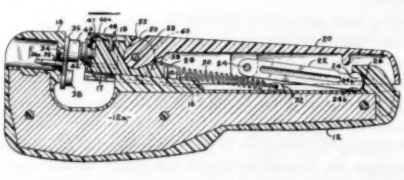
1. In a tool of the type having a pair of jaw members individually coupled to corresponding handle members and movable about a common pivot, the improvement comprising: means for selectively resetting the angular position of a first of said handle members with respect to a second of said handle members at any fixed point in the operative stroke of said tool without varying the position of said jaw members, said means including a first element located at the juncture between said first handle member and its associated jaw member and operatively coupled to said associated jaw member, and a second element coupled to said first handle member and releasably engageable with said first element at selective locations thereon.

4,144,738

FASTENER SETTING HAND TOOL

Walter H. Dziura, Naugatuck, and Robert B. Kendall, Southington, both of Conn., assignors to Scovill Manufacturing Company, Waterbury, Conn.

Filed Oct. 11, 1977, Ser. No. 840,652
Int. Cl.[2] B21D *7/06*
U.S. Cl. 72—410 **7 Claims**



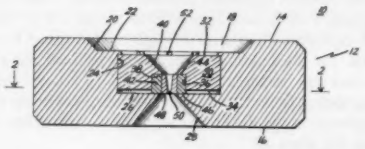
1. A fastener applier comprising an elongate handle having a fixed jaw disposed rigidly at one end thereof, a movable jaw opposing the fixed jaw, the movable jaw being operatively mounted on a track on the handle and movable toward and away from the fixed jaw, the jaws each having holding means on its working face for holding, respectively, the parts of a fastener, lever means having at one end a head pivotally secured to the movable jaw and comprising an operating lever for the applier, a link pivotally attached to the lever intermediate its ends, the distal end of the link being pivotally associated with the handle at the end of the handle opposite the fixed jaw, spring means operatively connected between the movable jaw and a point on the handle spaced toward the said opposite end from the movable jaw, whereby movement of the lever means toward the handle moves the jaws together against the bias of the spring to set the fastener parts disposed in the respective jaws.

4,144,739

WIRE DRAWING DIE AND METHOD OF MAKING THE SAME

Lawrence W. Corbin, Fort Wayne, Ind., assignor to Fort Wayne Wire Die, Inc., Fort Wayne, Ind.

Filed Oct. 13, 1977, Ser. No. 841,886
Int. Cl.[2] B21C *3/02*
U.S. Cl. 72—467 **14 Claims**



1. A wire drawing die comprising; a metal casing having flat, parallel front and back sides, said front casing side having a first cavity formed therein having a flat bottom wall, said first cavity having a cylindrical side wall extending from said front casing side to said bottom wall, a metal plug having top and bottom ends and a cylindrical outer surface extending between said ends, said plug being mechanically secured in said first casing cavity with a close, non-deforming fit, said bottom end being adjacent said bottom wall; one of said bottom end and bottom wall having a second cavity formed therein concentric with said first cavity and having a cylindrical side wall extending to a flat bottom; a metal blank having flat opposite ends and a cylindrical outer surface extending between said ends, said blank having a concentric core formed of synthetic hard, wear-resistant material, said blank being closely fitted in said second cavity with one end engaging the bottom thereof and with the other end of said blank engaging the other of said bottom end and bottom wall; said plug top end and casing back side having concentric countersunk openings therein respectively extending to said core, said core having a concentric die opening therethrough communicating between said countersunk openings.

4,144,740

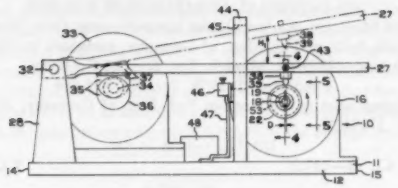
TESTING APPARATUS AND METHOD FOR MEASURING CUTTING, CHIPPING AND ABRASION RESISTANCE

James R. Beatty, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 1, 1978, Ser. No. 901,933
Int. Cl.[2] G01N *3/56*
U.S. Cl. 73—8 **16 Claims**

10. A method of measuring the cutting and chipping resistance of a disc-shaped test specimen of resilient material comprising initially measuring the outside diameter of said specimen, positioning a cutting member above said specimen, rotating said specimen about a generally horizontal axis at a predetermined speed, intermittently lifting and dropping said cutting member at a predetermined frequency for cutting engagement with the outer peripheral surface of said specimen, stopping the rotation of said specimen and the dropping of said cutting member and finally measuring the outside diameter of said

specimen in the area of said peripheral surface engaged by said cutting member to determine the decrease in diameter which is



an indication of the cutting and chipping resistance of said material being tested.

4,144,741

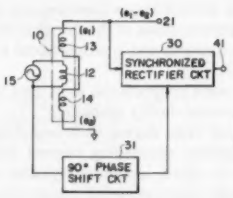
VOID DETECTING DEVICE

Koichiro Nakamoto; Nobumi Ohyama; Kiyoshi Adachi, all of Tokyo, and Hajime Kuwahara, Musashino, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu-Jigyodan and Yokogawa Electric Works, Ltd., both of Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 782,238

Int. Cl.[2] G01N *27/00*

U.S. Cl. 73—19 **4 Claims**



1. A void detecting device comprising a detector having at least one exciting coil to receive an a-c signal applied thereto and two detecting coils provided in the proximity of said exciting coil, said detector being adapted to be inserted into a conductive fluid to be measured; and a circuit for obtaining a flow-or-temperature-responsive output signal by combining signals of said two detecting coils; the improvement wherein a void signal is obtained comprising:

synchronized rectification means having first and second inputs and a void signal output;

means coupling said flow-or-temperature-responsive output signal to said first input; and

means coupling to said second input a signal the phase of which is shifted substantially ± 90° with respect to said flow-or-temperature-responsive output signal.

4,144,742

MACHINE FOR TESTING BOTTLES

Dieter K. Schmidt, and Josef J. Buschor, both of Los Gatos, Calif., assignors to New Century Beverage Company, San Francisco, Calif.

Filed Nov. 23, 1977, Ser. No. 854,240

Int. Cl.[2] G01M *3/02*

U.S. Cl. 73—37 **13 Claims**

1. Apparatus for testing a bottle at a test station with water under pressure to test the bottle for failure or for a leak, said apparatus comprising:

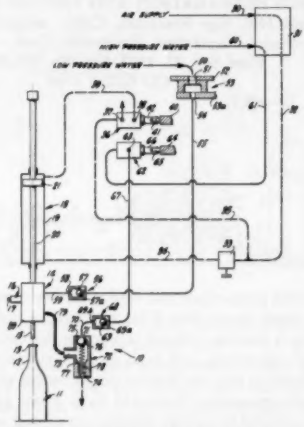
(a) a test head at such station having a sealing portion and movable between a first position retracted from the bottle and a second position with the sealing portion in sealing contact with the crown of the bottle

(b) means for automatically so moving said head

(c) a tube carried by such head and protruding from the sealing portion of the head, said tube providing a first, central water passage and forming with the head a second, annular water passage located between the tube and the head,

(d) means for automatically supplying low pressure water through the tube to the bottle when the head is in its second, sealing position sealed to a bottle at said test station,

(e) air venting means operable to vent air displaced by low pressure water through said annular passage,



(f) means for automatically supplying high pressure water through said annular passage to said bottle when the bottle is filled with low pressure water,

(g) means actuated by drop of pressure when high pressure water is supplied to the bottle to sense a failure or a leak and

(h) means for automatically retracting the test head at the conclusion of the pressure test.

4,144,743

ELECTRONIC FLUID PIPELINE LEAK DETECTOR AND METHOD

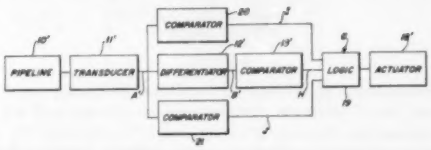
Morris T. Covington, and Steven M. Griffin, both of Houston, Tex., assignors to Shafer Valve Company, Mansfield, Ohio

Division of Ser. No. 638,342, Dec. 8, 1975, Pat. No. 4,091,658, which is a division of Ser. No. 530,709, Dec. 9, 1974, Pat. No. 4,012,944. This application Feb. 16, 1978, Ser. No. 878,566

The portion of the term of this patent subsequent to Mar. 22, 1994, has been disclaimed.

Int. Cl.[2] G01M *3/28*

U.S. Cl. 73—40.5 R **16 Claims**



1. A system for detecting irregularities in a fluid carrying pipeline or the like comprising; transducer means monitoring a characteristic of the fluid in the pipeline and providing an output signal proportional thereto; differentiator means receiving the output signal of said transducer means and providing an output signal proportional to the rate of change of said characteristic with respect to time; comparator means receiving the output signal of said differentiator means, comparing that output signal with a preselected rate of change of said charac-

teristic with respect to time and providing an output signal when the output signal of said differentiator means exceeds said preselected rate of change; timing means receiving the output signal of said comparator and providing an output signal after a predetermined time delay; said output signal of said timing means being indicative of an irregularity in the fluid pipeline of sufficient size to warrant correction.

4,144,744

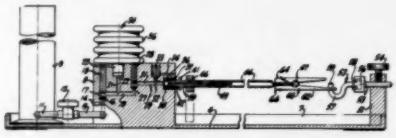
VEIN PREPARATION AND TESTING DEVICE

J. Donald Hill, San Francisco, Calif., assignor to Thoratec Laboratories Corporation, Emeryville, Calif.

Filed Sep. 21, 1977, Ser. No. 835,185

Int. Cl.[2] G01M *3/04*

U.S. Cl. 73—49.1 **8 Claims**



1. A vein preparation and testing device comprising a base, a head block upstanding from said base, a hollow head grip including a portion adapted to engage the exterior of a vein, means for mounting said head grip for rotation on said head block about an axis and against displacement along said axis, a tail block upstanding from said base, a tail grip including a portion adapted to engage the exterior of said vein, and means for mounting said tail grip for rotation on said tail block about said axis and against displacement along said axis.

4,144,745

VISCOMETER

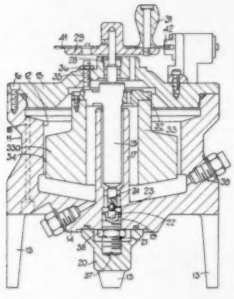
Alistair D. Sivill, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 23, 1978, Ser. No. 871,405

Claims priority, application United Kingdom, Jan. 28, 1977, 3471/77

Int. Cl.[2] G01N *11/14*

U.S. Cl. 73—59 **9 Claims**



1. A viscometer including a casing defining therein a chamber, a rotor mounted in the chamber.so as to define with the walls of the chamber a space for receiving the liquid whose viscosity is to be measured, bearing means interposed between the casing and the rotor so that the rotor is capable of rotational movement about an axis thereof relative to the casing, and means for monitoring the deceleration of the rotor when the rotor is rotating under the action of stored kinetic energy against the viscous drag of said liquid, said means being responsive to at least two of the three variables time, angular distance travelled by the rotor, and angular speed of the rotor.

4,144,746

METHOD FOR DETERMINING A MEASUREMENT VALUE PROPORTIONAL TO THE COMPRESSION OF AN INTERNAL COMBUSTION ENGINE

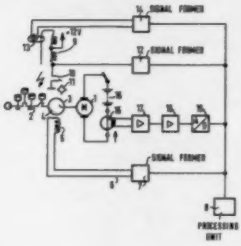
Albert Maringer, Karlsruhe, and Hans-Henning Otte, Neuburg, Pfalz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 1, 1978, Ser. No. 882,456

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2709128

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—117.2 **8 Claims**



1. A method for determining a measurement value which is derived from the current drain of the starter motor cranking an internal combustion engine and is proportional to the compression thereof, comprising:

a) measuring a value proportional to at least the a-c component of the current during cranking;

b) integrating said value during each complete engine cycle between respective succeeding current minima with respect to time to obtain individual cylinder values;

c) integrating said value over a full engine cycle and averaging the integral to obtain an average value;

d) finding the difference between said average value and each individual cylinder value; and

e) adding each difference with its sign reversed, to the next following individual cylinder value to obtain improved values whereby the values thus obtained will serve as comparison measures for the compression in the individual cylinders.

4,144,747

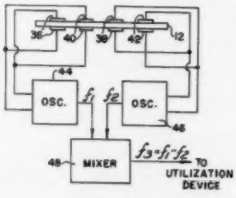
SIMULTANEOUSLY RESONATED, MULTI-MODE CRYSTAL FORCE TRANSDUCER

Walter F. Datwyler, Jr., Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 30, 1978, Ser. No. 873,459

Int. Cl.[2] G01L *1/16*

U.S. Cl. 73—141 R **31 Claims**



14. A force transducer comprising:

a piezoelectric crystal;

means for applying a force to be determined to said piezoelectric crystal;

first means for resonating said piezoelectric crystal in a first

resonant mode having a first frequency-force characteristic to generate a first resonant frequency variable as a function of the applied force;

second means for simultaneously resonating said same piezoelectric crystal in a second resonant mode having a second frequency-force characteristic different from said first frequency-force characteristic to generate a second resonant frequency variable as a function of the applied force;

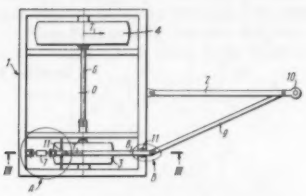
means responsive to said first and second resonant frequencies for generating a signal indicative of the applied force.

4,144,748

DEVICE FOR DETERMINING COEFFICIENT OF ADHESION OF PNEUMATIC WHEEL TIRES OF TRANSPORT VEHICLES TO ROAD PAVEMENT

Alexandr P. Vinogradov; Mikhail A. Pechersky, both of Moscow, U.S.S.R., and Andrei S. Tkachenko, deceased, late of Moscow, U.S.S.R. (by Nadezhda A. Tkachenko, administrator), assignors to Gosudarstvenny Proektno-Izyskatelsky i Nauchno-Issledovatelsky Institut "Aeroproekt", Moscow, U.S.S.R.

Filed Oct. 26, 1977, Ser. No. 845,678
Int. Cl.² G01N *19/02*
U.S. Cl. 73—146 **3 Claims**



1. A device for determining the coefficient of adhesion of wheel tires of transport vehicles to a road pavement comprising: a single-axle trailer having a frame, said frame having two wheels on which said frame is mounted and which are adapted for rotating in the course of movement of said trailer with longitudinal slipping in opposite directions; a tow pole articulated to said frame for coupling it to a towing vehicle; a recording instrument with a sensitive element located between the frame and the free end of the trailer tow pole and linked kinematically with said frame and pole in such a manner that when the trailer is moved said sensitive element is acted upon by a force which is proportional in magnitude to the sum of absolute values of the longitudinal traction forces acting on the wheels of said trailer and which is directed, essentially, parallel to said forces, the wheels of said trailer having different diameters and being arranged symmetrically relative to the trailer centre of gravity, the sensitive element being articulated to the trailer frame at the point where it intersects the rolling plane of one of the wheels; and means for kinematically linking said sensitive element with the tow pole and comprising longitudinal and side rods articulated to each other so that a free end of the longitudinal rod is articulated to the sensitive element and is installed on the trailer frame with a provision for axial motions in the rolling plane of said wheel, essentially parallel to the road pavement, while a free end of the side rod is articulated to the free end of the tow pole.

4,144,749

TOTAL BODY VOLUME METER

Henry B. Whitmore, Rte. 1, Box 369, San Antonio, Tex. 78211

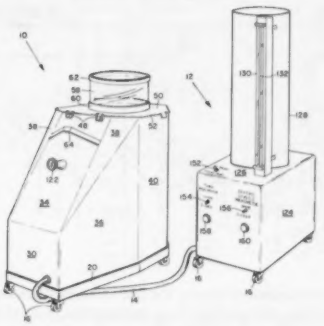
Filed Dec. 9, 1977, Ser. No. 859,083
Int. Cl.² G01F *17/00*
U.S. Cl. 73—149 **14 Claims**

1. A total body volume meter for measuring body volume of an individual comprising:

body tank means for holding a fluid therein, said body tank means having an enlarged upper opening for receiving said individual therethrough;

uniform cross-sectional vertical tank means connected to said body tank means through conduit means;

extension means of said enlarged upper opening, said extension means having a cross section approximately equal to said vertical tank means;



a plurality of manometer means connected to said body tank means and said vertical tank means; and

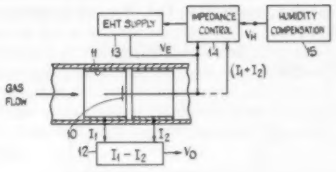
control means interconnected along said conduit means between said body tank means and said vertical tank means, levels of said fluid to be measured in said vertical tank means and said extension means by said manometer means before and after said individual enters said body tank means being adjusted by said control means.

4,144,750

GAS FLOW TRANSDUCERS AND I.C. ENGINE CONTROL SYSTEMS INCORPORATING SUCH TRANSDUCERS

Martin A. Read, Redditch, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 22, 1976, Ser. No. 753,111
Claims priority, application United Kingdom, Jan. 13, 1976, 1118/76
Int. Cl.² G01F *1/56*
U.S. Cl. 73—194 F **4 Claims**



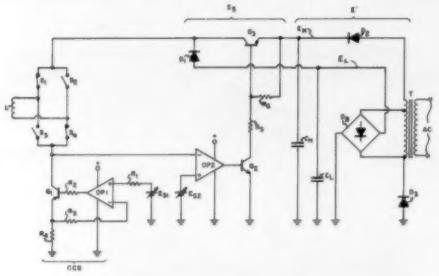
1. A gas mass flow transducer comprising the combination of a gas flow passage, an ion discharge electrode in said passage, extended ion collection electrode means in said passage spaced from the discharge electrode, said extended electrode means having output terminals connected to portions of the extended electrode means spaced longitudinally of the passage, high voltage supply means for supplying discharge current to the discharge electrode, means sensitive to the humidity of a gas flowing through said passage, means controlled by said humidity sensitive means for varying the resistance of the discharge as a function of humidity and means connected to said output terminals for producing an output signal corresponding to the difference between the currents flowing from said output terminals.

4,144,751

SQUARE WAVE SIGNAL GENERATOR

Akira Yokoyama, Tokyo, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 6, 1977, Ser. No. 830,989
Int. Cl.[2] G01F *1/60*
U.S. Cl. 73—194 EM **7 Claims**



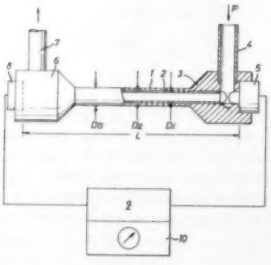
5. In an excitation circuit for use in an electromagnetic flow meter of the class wherein a rectangular waveform electric current is utilized for field coil excitation and said circuit comprises a series connection of a DC voltage source, a switching circuit for reversing the polarity of a DC voltage supplied to the field coil by the DC voltage source and a constant current circuit, characterized in that the DC voltage source is able to provide two different output voltages, and including a switch means for selecting one of the two different output voltages in a first mode of operation and the other of the two different output voltages in a second mode of operation and switch control means responsive to a driving voltage for a current being supplied to the field coil to operate said switching means between said first and second modes of operation so that a higher output voltage is selected during a transient period of excitation current following changeover operation of said switching circuit while the lower output voltage is selected during the steady-state excitation current operation.

4,144,752

ULTRASONICALLY OPERATIVE DEVICE FOR DETERMINING PHYSICAL QUANTITIES OF A MEDIUM

Søren Lolk, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Oct. 19, 1977, Ser. No. 843,407
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648718
Int. Cl.[2] G01F *1/66*
U.S. Cl. 73—194 A **5 Claims**



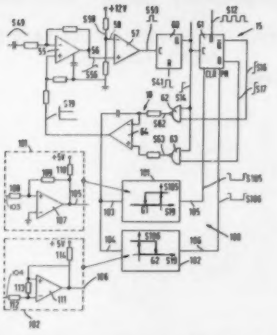
1. An ultrasonically operative device operable with an ultrasonic signal having a predetermined wave length for determining physical quantities such as the flow speed of a medium, comprising, an ultrasonic transmitter and an ultrasonic receiver, tube means defining a transmission path extending between said transmitter and said receiver, said tube means having an internal diameter of less than about 15 times said predetermined wave length, said tube means having an inner surface of a material having a lower acoustic impedance than metal.

4,144,753

CIRCUIT ARRANGEMENT FOR DETERMINING PHYSICAL PARAMETERS OF FLOWING MEDIA BY THE ULTRASONIC METHOD

Poul M. Larsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 12, 1977, Ser. No. 823,995
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637107
Int. Cl.[2] G01F *1/66*
U.S. Cl. 73—194 A **6 Claims**



1. A circuit for determining the arrival time of an ultrasonic signal, comprising, means for transforming said ultrasonic signal to a substantially linearly increasing signal, threshold value detector means for transforming said linearly increasing signal to an arrival delay signal, phase detector means for determining the phase position of said arrival delay signal relative to a reference signal, said phase detector means generating early signals on early arrival of said delay signal and generating late signals on late arrival of said delay signal, regulator integrator means between said phase detector means and said threshold value detector means producing an output voltage for altering the delay period of said arrival delay signal responsive to the phase position of said delay signal, resetting means between said regulator integrator means and said phase detector means for resetting said integrator means to zero when said output voltage reaches a predetermined maximum or minimum value to cause said output voltage to return to zero.

4,144,754

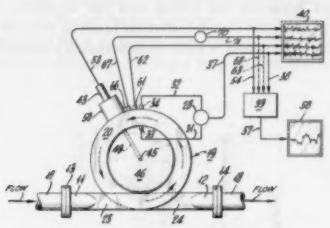
MULTIPHASE FLUID FLOW METER

Robert W. Pitts, Jr., and Dan M. Arnold, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,117
Int. Cl.[2] G01F *1/88*
U.S. Cl. 73—205 D **15 Claims**

1. Multiphase fluid flow meter, comprising
a conduit for said fluid to flow therethrough,
said conduit including a circular loop for subjecting said fluid to centrifugal force and forming a space inside of said loop,
means for measuring the pressure differential between the inside and outside radii on said loop,

means for measuring the average density taken radially across the fluid flowing through said loop and,



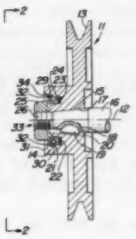
means for determining the rate of fluid flow through said meter by combining said measurements.

4,144,755

V-BELT PULLEY

Herbert Palloch, Schwetzingen, Fed. Rep. of Germany, assignor to Teledyne Mid-America Corporation, Los Angeles, Calif.

Filed Feb. 3, 1978, Ser. No. 874,900
Int. Cl.[2] F16H *55/36*; B25G *3/00*; F16B *11/00*
U.S. Cl. 74—230.01 **12 Claims**



1. A mechanical draw-off device for a part having a hub with a tapered bore into which is fitted a shaft having a threaded free end and a tapered section proximate to the said free end, which shaft tapered section is tapered complementally to the tapered bore of the said hub, said draw-off device comprising in combination,

(a) an annular recess formed in the hub and extending inward from the hub face proximate to the hub tapered bore end of smaller diameter, said recess being concentric with said tapered bore,

(b) a nut having a main body threaded to rotatably engage the threaded free end of the said shaft when the latter is projected into the tapered bore of the hub, said nut having a flange extending peripherally radially from the main body and projecting freely rotatably into said hub annular recess, and

(c) nut retention means carried by said hub effective to capture said nut flange within said hub recess while permitting axial movement of said nut with respect to said hub along the axis of said hub tapered bore,

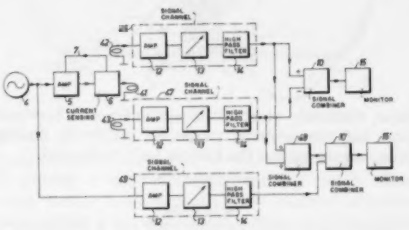
whereby, when said part is installed on said shaft, said nut is threadable onto said shaft threaded end and must be rotated in a first direction to advance said nut on said shaft for a distance before said shaft and hub become firmly engaged, and said nut when thereafter rotated in a direction counter to said first direction moves backward off of said shaft and engages said hub carried nut retention means to thereby draw said part off of said shaft.

4,144,756

ELECTROMAGNETIC MEASUREMENT OF QUANTITIES IN CONNECTION WITH ELECTRICALLY CONDUCTING LIQUID MATERIAL

Sten V. Linder, Tystberga, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed May 17, 1977, Ser. No. 797,654
Claims priority, application Sweden, May 20, 1976, 7605759
Int. Cl.[2] G01F *23/00*
U.S. Cl. 73—290 R **39 Claims**



1. An arrangement for electro-magnetic measurement at high temperature of at least one parameter of a liquid electrically conducting material contained in a container, comprising:

an AC power supply for supplying a transmitter signal,

at least one transmitter coil arranged to be supplied with a transmitter signal from the AC power supply for producing an alternating magnetic field,

at least one receiver coil arranged to sense the alternating magnetic field and to generate a receiver signal in dependence thereon,

said coils being arranged in association with a wall of said container so that the alternating magnetic field sensed by a receiver coil varies in accordance with said parameter, means connected to said at least one receiver coil for detecting said receiver signal to produce a measurement signal,

wherein said coils are coreless transmitter and receiver coils which are essentially freely positionable and have at most a relatively few number of turns,

at least two signal channels, each of said signal channels being arranged to transfer one of said transmitter and receiver signals, and at least one of said signal channels including signal processing means for adjustment of at least one parameter of the signal transferred by the signal channel to balance the transferred signal and remove disturbing signals,

and means for producing counteraction between the signals transferred by the signal channels so that when the liquid electrically conducting material is in a basic position and when said signal processing means are properly adjusted the basic measurement signal obtained is at least substantially balanced with regard to disturbing and unbalance signals.

4,144,757

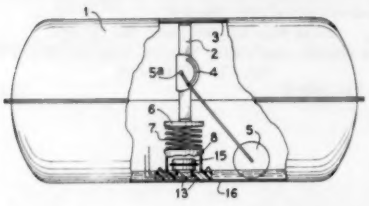
DEVICES FOR CONTROLLING THE LEVEL OF A LIQUID IN A TANK

Joël Mauboussin, Bezons, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Apr. 5, 1978, Ser. No. 893,797
Claims priority, application France, Apr. 15, 1977, 77 11472
Int. Cl.[2] H01H *35/18*
U.S. Cl. 73—308 **3 Claims**

1. A device for indicating the level of a liquid contained in a tank having an upper wall and a bottom wall, comprising, in combination with the tank, a support fixed to the upper wall, retaining means, a float quidedly combined with the retaining means to be movable between an upper position and lower

position, a switch carried by said retaining means and cooperative with the float to be closed by the float when the latter is in said lower position and opened when the float is in said upper



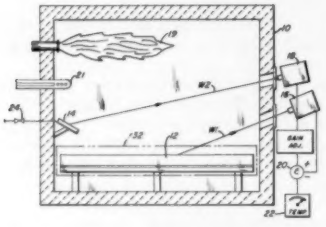
position, elastically yieldable means interposed between said support and the retaining means for elastically biasing the retaining means against the bottom wall of the tank.

4,144,758

RADIATION MEASUREMENT OF A PRODUCT TEMPERATURE IN A FURNACE

John E. Roney, Monroeville, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Sep. 12, 1977, Ser. No. 832,674
Int. Cl.[2] G01J *5/06, 5/52*
U.S. Cl. 73—355 R **19 Claims**



1. Temperature measuring apparatus for measuring the surface temperature of a hot item in a furnace comprising:

a reference plate disposed within the furnace;

means for cooling the reference plate below a predetermined temperature at which its emitted radiation is not significant;

item radiation detecting means for providing an output signal proportional to the emitted plus reflected radiation from the hot item;

reference plate radiation detecting means for providing an output signal proportional to the reflected radiation from said reference plate; and,

means for substracting the output signal of said reference plate radiation detecting means from the output signal of said item radiation detecting means.

4,144,759

AUTOMATIC PULVERIZED COAL SAMPLER

Alfred A. Slowik, 120 Keppler Dr., Johnstown, Pa. 15905

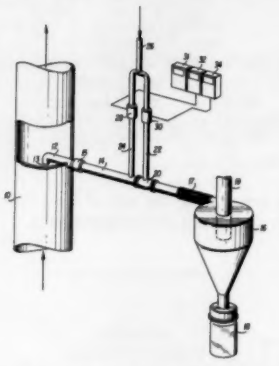
Filed Nov. 16, 1977, Ser. No. 851,864
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—422 R **9 Claims**

1. An apparatus for periodically sampling pulverent material moving by pressurized gas through a pipe by diverting a portion of the gas and pulverent material to freely flow therethrough, said apparatus comprising:

a probe fixed in relation to the pipe and having an open mouth facing upstream in the pipe at approximately the center of the pipe;

a cyclone separator connected to said probe by a conduit and having a vent open to the atmosphere and a sample collecting means;

a quick opening free flowing fluid operated valve in said conduit between the probe and the cyclone, the valve having an outer housing and an internal flexible cylinder within the housing which closes radially inwardly when



subjected to fluid pressure by pressurizing the space between the cylinder and the housing;

an air line connected to said conduit between the valve and the probe to purge pulverent material therefrom;

control means to open and close said air line and said valve at spaced periodic intervals.

4,144,760

METHOD AND IMPLEMENT TO TAKE AND COLLECT SAMPLE MATERIAL, ESPECIALLY FOR SCIENTIFIC OR DIAGNOSTIC EXAMINATION

Gert Schlüeter, Liederbach, and Wilhelm Schuster, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 30, 1977, Ser. No. 838,393
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644281
Int. Cl.[2] G01N *1/28*
U.S. Cl. 73—425 **10 Claims**

1. A method for taking and collecting sample material characterized in bringing a sampler, after wetting and hence superficial dissolution, said sampler consists entirely, or at least at its surface or contact area, of a plastic material which is soluble in water, into contact with the surface to be examined, whereby said sample material sticks to the plastic, removing said sampler from contact with said surface, placing said sampler, or at least said surface or contact area of said sampler, after sampling, on a microscopic slide, or spreading it out on a slide, and dissolving said plastic material carefully on said slide by the addition of water, during such process the individual constitutents of said sample material adhering to said slide at the respective contact sites with retention of the original topography of the sampling area.

4,144,761

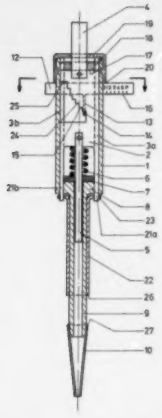
HANDPIPETTE

Heinz Dzaack, Munich, Fed. Rep. of Germany, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Feb. 24, 1978, Ser. No. 880,894
Claims priority, application Sweden, Feb. 25, 1977, 7702086
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—425.6 **8 Claims**

1. A measuring handpipette suitable for one-hand operation comprising a piston axially displaceable in a cylinder into which liquid is sucked, the displacement of the piston being

controlled by a measuring means having at least two relatively displaceable elements, one of said two elements being movable with said piston, the other of said two elements being movable with respect to the cylinder between a plurality of predetermined positions by a finger of the hand holding the cylinder, one of said two elements having a stop means, the other of the



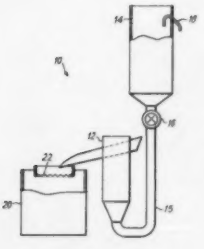
two elements also having a sloping surface which engages with said stop means at selected locations to adjustably limit movement of the piston in one direction by an amount corresponding to one of the predetermined positions of the first mentioned other element, said piston including a pushbutton projecting outwardly of the cylinder for movement of the piston in said one direction also by a finger of the hand holding the cylinder.

4,144,762

ANALYZING PLASTIC CONCRETE

William G. Duxbury, 64 Winslade Rd., Sidmouth, Devon, England

Filed Jun. 13, 1977, Ser. No. 806,268
Int. Cl.[2] G01N *5/00*
U.S. Cl. 73—432 R **12 Claims**



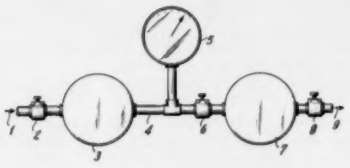
1. A method of analyzing plastic concrete comprising the steps of: measuring a known amount of plastic concrete sample into a container, passing a known weight of liquid upwardly through said sample to remove cement and cement-fine material therefrom, weighing the liquid with the cement and cement-fine material and determining from the known and measured parameters the weight of cement and cement-fine material in the sample.

4,144,763

NON-INVASIVE METHOD FOR THE MEASUREMENT OF BODY FAT

Joseph H. Vogelman, 48 Green Dr., Roslyn, N.Y. 11576

Filed Mar. 29, 1978, Ser. No. 891,183
Int. Cl.[2] G01N *9/02*
U.S. Cl. 73—433 **4 Claims**



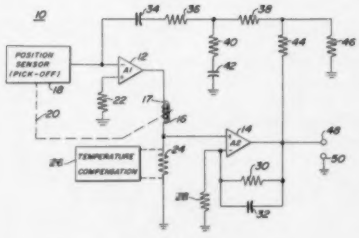
3. A non-invasive method for the measurement of body fat of a body capable of respirating utilizing a first airtight chamber of known volume and a second airtight chamber of unknown volume comprising the steps of pressurizing said first chamber, sealing said first chamber and measuring the initial pressure I_c, sealing said second chamber from the atmosphere, communicating said pressure I_c from said first chamber to said second chamber, measuring the final pressure of both chambers F_c, returning both chambers to atmospheric pressure, sealing said first chamber from said atmospheric pressure, pressurizing said first chamber to a pressure I_X, placing said body to be measured within said second chamber, sealing said second chamber from atmospheric pressure, communicating the pressure of said first chamber to said second chamber, allowing the temperature of both chambers to become stabilized, measuring the final pressure F_X of said chambers with said body therein determining the volume X of said body to be measured by the formula: $X = Z\,(I_c/F_c - I_X/F_X)$, and determining the fat fraction of said body from the volume and weight of the object and the known fat proportions of said body.

4,144,764

SERVO AMPLIFIER FOR AN ELECTRICALLY DAMPED ACCELEROMETER

Robert E. Hartzell, Jr., Voorhees, N.J., assignor to Schaevitz Engineering, Pennsauken, N.J.

Filed May 11, 1978, Ser. No. 905,012
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—497 **9 Claims**



1. In combination with a position detector for producing electrical signals corresponding to positions of a torque coil subject to movements resulting from acceleration forces,

a servo amplifier system for producing error signals for application to said torque coil to counteract the movements resulting from said acceleration forces, comprising:

a. a first amplifier having input and output circuits;

b. said torque coil being included in said output circuit of said first amplifier;

c. means for applying said electrical signals from said position detector to said input circuit of said first amplifier;

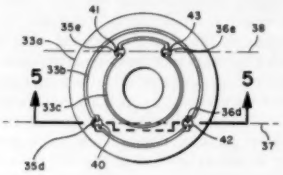
d. a second amplifier having an input circuit and a low impedance output circuit;
e. a load element in said input circuit of said second amplifier connected to said torque coil to develop a voltage thereacross corresponding to the induced current through said torque coil resulting from movement thereon;
f. a feedback network connected from the output circuit of said second amplifier to the input circuit of said first amplifier;
g. utilization means connected to the output circuit of said second amplifier.

4,144,765

LINEAR ACCELEROMETER WITH TORSION HINGE SUSPENSION

Vernon H. Aske, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 21, 1977, Ser. No. 835,274
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—517 B **18 Claims**



1. An accelerometer comprising:
a housing having an input axis fixed relative thereto;
a mass located within said housing for sensing acceleration along the input axis;
first and second torsion hinge means respectively located along first and second parallel hinge axes fixed relative to said mass and perpendicular to the input axis, each of said first and second torsion hinge means comprising first and second torsion members spaced along the hinge axis associated therewith;
third and fourth torsion hinge means respectively located along third and fourth hinge axes fixed relative to said housing and parallel to the first and second hinge axes, each of said third and fourth torsion hinge means comprising first and second torsion members spaced along the hinge axis associated therewith;
a first intermediate arm joining the first torsion members of said first and third torsion hinge means;
a second intermediate arm joining the second torsion members of said first third torsion hinge means; and
a third intermediate arm joining the first torsion members of said second and fourth torsion hinge means;
a fourth intermediate arm joining the second torsion members of said second and fourth torsion hinge means; and
force rebalance means for maintaining said mass at a substantially fixed location along the input axis.

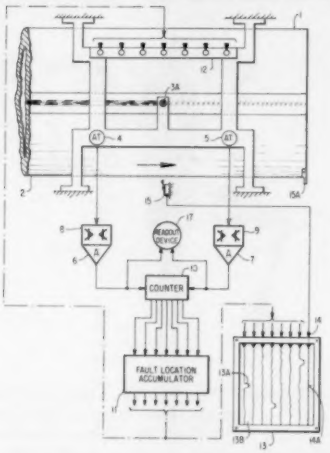
4,144,766

APPARATUS FOR THE IN-SITU DETECTION AND LOCATION OF FLAWS IN WELDS

Allen E. Wehrmeister, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 2, 1977, Ser. No. 793,026
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—587 **7 Claims**

1. A system for the in-situ detection and location of flaws in welds wherein a work piece is moved relative to a welder electrode, the combination comprising, a first acoustic transducer located a first preselected distance ahead of the electrode, a second acoustic transducer located a second preselected distance following the electrode, said first and second transducers each receiving the acoustic emissions generated by a fault within the weld bead and generating an output signal corresponding in amplitude and frequency to the amplitude and frequency of said acoustic emissions, and means responsive



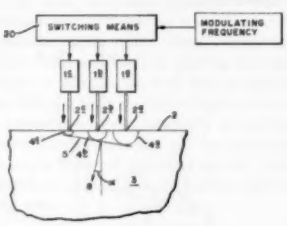
to the output signals of said transducers generating a signal indicative of the location of the fault in said bead comprising means determining the difference in the times required for emissions from said fault to travel to said first and second transducers.

4,144,767

METHOD AND APPARATUS FOR PRODUCING PULSE-SHAPED ACOUSTIC WAVES ON A WORKPIECE SURFACE

Walter Kaule, and Erik Primbsch, both of Cologne, Fed. Rep. of Germany, assignors to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Dec. 1, 1977, Ser. No. 856,338
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707933
Int. Cl.[2] G10N *29/04*
U.S. Cl. 73—643 **2 Claims**



1. The method of producing free of physical contact on the surface of a light absorbing workpiece an ultrasonic pulse wave having a predetermined angle of propagation relative to an axis normal to the workpiece surface comprising:
illuminating sequentially each of a plurality of equidistantly spaced strip-like portions disposed on the workpiece surface with a respective pulse of coherent radiation;
selecting the time delay between illuminating two adjacent strip-like portions in accordance with the formula:

$$t = d \times \sin\alpha / c$$

wherein:

t is the time delay, d is the center to center distance between two adjacent strip-like portions, α is the angle of propagation of the resulting ultrasonic wave in the workpiece relative to an axis normal to the workpiece surface, and c is the velocity of propagation of the wave in the workpiece, and

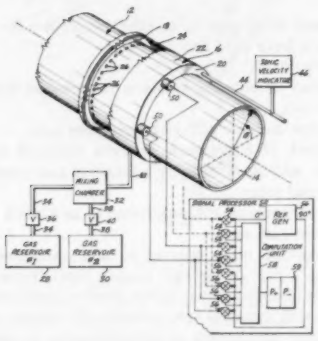
modulating each pulse of coherent radiation while illuminating a respective strip-like portion, the frequency of said modulating being equal to the period of the ultrasonic wave produced.

4,144,768

APPARATUS FOR ANALYZING COMPLEX ACOUSTIC FIELDS WITHIN A DUCT

Anders O. Andersson, Seattle, and Robert B. Purves, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1978, Ser. No. 866,390
Int. Cl.[2] G01N *29/02*
U.S. Cl. 73—646 **6 Claims**



1. An acoustic measurement system for determining the modal structure of an acoustic pressure field within a duct comprising:

an acoustic filter including at least one acoustic cavity, said acoustic filter in acoustic communication with said duct to couple sound energy from said duct to each of said acoustic cavities, each of said acoustic cavities being dimensioned and arranged to exhibit resonance in response to a modal component of said acoustic pressure pattern within said duct when the velocity of sound within each of said cavities is established at a predetermined value;

gas supply means for supplying a mixture of gasses to each of said acoustic cavities of said acoustic filter, said gas supply means including means for varying the composition of said gas mixture supplied to said acoustic cavities to selectively tune said filter for resonance at a plurality of modal components of said acoustic pressure field; and

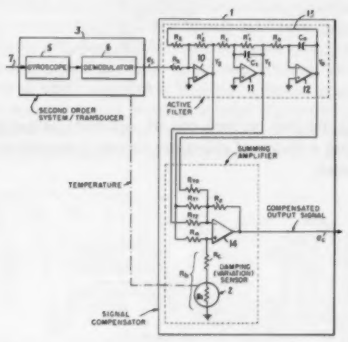
acoustic detector means mounted in acoustic communication with said acoustic filter, said acoustic detector means supplying a signal representative of the acoustic pressure within said acoustic cavities to provide an indication of the amplitude of the modal component of said pressure field which excites said cavities into resonance.

4,144,769

ELECTRONIC COMPENSATION FOR TEMPERATURE VARIATION OF GYROSCOPE DAMPING

Arthur Mayer, Kew Gardens, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Jan. 24, 1977, Ser. No. 762,230
Int. Cl.[2] G01C *19/04*; G01P *3/00*; G01L *19/04*
U.S. Cl. 74—5.5 **3 Claims**



1. A fluid damped single-degree-of-freedom rate gyroscope and signal compensating means in combination comprising:

a gimbal;

a rotor supported within said gimbal with an axis of spin;

a housing supporting said gimbal to permit its rotation about an axis perpendicular to said axis of spin in response to an angular rate input;

a fluid within said housing surrounding said gimbal for damping movement thereof;

means for producing an output signal which is proportional to the angular displacement of the gimbal; and

a signal-compensating means responsive to damping variations and said output signal for providing a compensated signal indicative of said angular rate input and substantially unresponsive to damping variations caused by temperature, said signal-compensating means comprising an active filter circuit having a first amplifier with an input coupled to said output signal, a second amplifier having an input coupled to an output of said first amplifier, and a third amplifier having an input coupled to an output of said second amplifier and an output coupled to said input of said first amplifier in a closed loop configuration; a damping (variation) sensor responsive to the temperature of said fluid; and a summing amplifier having a first input coupled to the outputs of said first, second and third amplifiers and a second input coupled to said second amplifier and said damping (variation) sensor, and an output providing said compensated signal.

4,144,770

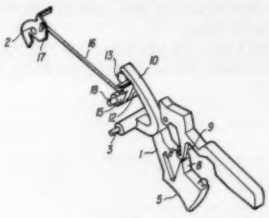
THROTTLE-VALVE CONTROL

Göte G. V. Landén, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden

Filed Apr. 21, 1977, Ser. No. 789,708
Claims priority, application Sweden, Apr. 22, 1976, 7604628
Int. Cl.[2] F16H *21/18*
U.S. Cl. 74—47 **4 Claims**

1. A throttle-valve control system for an engine mounted by oscillation damping means on a support structure, said engine and support structure being relatively pivotally moveable about a pivot center when the engine is in use, said arrangement comprising a pivotal throttle-valve, an operating member and a throttle-valve linkage of transmitting movement between said operating member and said throttle-valve, said throttle-valve linkage including a pair of interengaging levers pivoted on substantially parallel pivot shafts, said levers having mutu-

ally contacting surfaces through which movement is transmitted from one to the other of said levers on movement of said



operating member, at least one of said surfaces being curved and having a center of curvature located substantially at said pivot center.

4,144,771

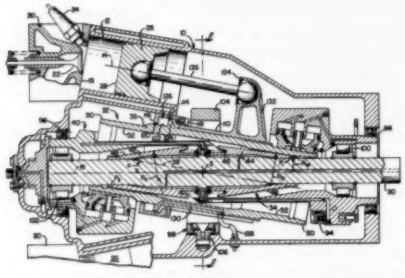
VARIABLE STROKE PISTON TYPE ENGINE

Yves J. Kemper, Birmingham, and Harvey N. Pouliot, Troy, both of Mich., assignors to Vadetec Corporation, Troy, Mich.

Filed Apr. 7, 1977, Ser. No. 785,662

Int. Cl.[2] F16H *23/00*

U.S. Cl. 74—60 **17 Claims**



1. A piston engine comprising:

a frame;

a first element rotatable on a first axis fixed with respect to said frame;

a tubular second element having concentric rolling and journal surfaces of revolution about a second axis inclined with respect to and intersecting said first axis at a point of axes intersection;

a third element and extending within and throughout the length of said second element, said third element being rotatable on said first axis and having diametrically eccentric bearing members spaced along said second axis on opposite sides of said point of axes intersection, said bearing members engaging said journal surfaces in a plane containing said first and second axes;

at least one fluid working chamber defined by said frame, a piston reciprocable in said working chamber on a third axis spaced from said first axis; and

means coupling said piston to said second element, said last mentioned means defining a thrust receiving point of engagement with said piston, said thrust receiving point being spaced from said point of axes intersection.

4,144,772

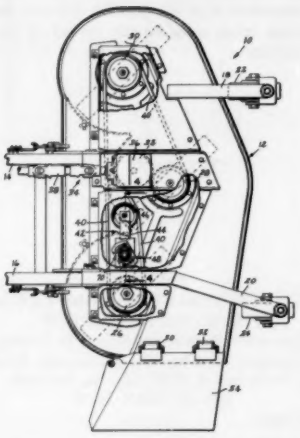
BELT IDLER CONSTRUCTION

John F. Brackin, Minnetonka, and Melvin H. Jendersee, Apple Valley, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Jul. 29, 1977, Ser. No. 820,116

Int. Cl.[2] F16H *7/10*

U.S. Cl. 74—242.15 R **9 Claims**



1. In a belt drive system, an idler mechanism for maintaing tension on a drive belt, comprising:

(a) an idler arm;

(b) a pulley mounted to said arm for rotation about a rotational axis;

(c) a socket member affixed to said idler arm;

(d) a block of elastomeric material received within said socket, said block defining a torsional axis parallel to said rotational axis;

(e) tool engagement means secured to said block along said torsional axis; and

(f) a mounting plate, secured to said engagement means, having a pair of circular arcuate slots therein sized to receive fastening means with a circular center corresponding to said torsional axis, whereby the tension applied by said idler mechanism to said belt may be adjusted by rotating said tool engagement means with a suitable tool.

4,144,773

BICYCLE SPROCKET WHEEL

Lyle F. Addicks, 12313 Brookshire Ave., Downey, Calif. 90242

Continuation-in-part of Ser. No. 696,428, Jul. 12, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,316

Int. Cl.[2] F16H *55/12, 55/30*

U.S. Cl. 74—243 DR **6 Claims**

1. In a sprocket wheel for a bicycle,

a molded plastic annular member having a rim provided on a structurally reinforced body portion,

said rim portion having radially extending teeth with straight front and back faces,

the thickness of the teeth to the tip thereof being of the same thickness as said rim portion,

the surfaces between successive teeth defining arcuate portions of a common circumference which extend from the base of the straight front face of a tooth to the base of the straight back face of an adjacent tooth, and

the inner edge of said annular member defining a plurality of sets of equally spaced arcuate sectors, the inner edges of the arcuate sectors in each set having a common radius different from the radii of the other sets, and each of said arcuate sectors having an attachment hole molded therein.

4,144,774

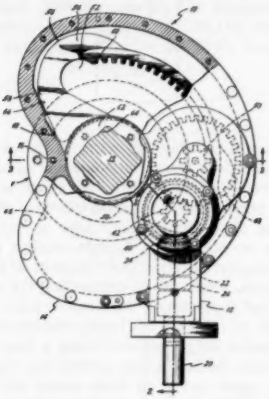
ACTUATOR DEVICE

Bernard E. Berlinger, Jr., Meadowbrook, Pa., assignor to Westran Corporation, Muskegon, Mich.

Filed Nov. 21, 1977, Ser. No. 853,437

Int. Cl.[2] F16H *55/04, 1/12;* **F16K** *31/44*

U.S. Cl. 74—435 **13 Claims**



1. An actuator device for driving a component of an associated device through a limited circumferenial extent, said actuator device comprising a gear train including first coupling means for coupling said gear train to driver means, said gear train having a relatively high efficiency and including pinion means and a sector gear of limited circumferential extent, said pinion means and said sector gear being in meshing engagement, said sector gear being formed on a periphery of one side of a generally triangular sector member, drive means for rotating a component of an associated device, said drive means being formed at the vertex of said sector member opposite said one side and being mounted for rotation about an axis perpendicular to a plane defined by the sides of said sector member whereby said pinion means is operative to drive said sector gear and rotate said drive means to effectuate movement of the component of the associated device.

4,144,775

TRANSMISSION FOR A TWO-WORM PRESS WITH COUNTER RUNNING WORMS

Heinrich Schäfer, Vellmar, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

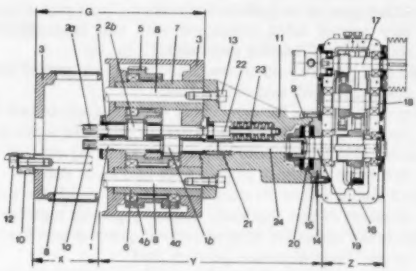
Filed Sep. 26, 1977, Ser. No. 836,474

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1976, 7632517[U]

Int. Cl.[2] F16H *37/06, 1/12, 1/18*

U.S. Cl. 74—665 GA **3 Claims**

1. A transmission for a two-worm press with two counter-running worms, which includes: a first transmission housing, two transmission output shafts journalled in said transmission housing for respective connection with two worms in a two worm press, one of said transmission output shafts being a driving shaft and the other one of said transmission output shafts being a driven shaft, gears including first gears laterally offset relative to each other, and respectively drivingly associated with said transmission output shafts, said gears also including second gears representing intermediate gears and drivingly interconnecting said first gears, said two transmission output shafts with said first and second gears being journalled in said transmission housing, a bearing housing detachably connected to said transmission housing, a first extension shaft arranged in said bearing housing in axial alignment with said driving transmission output shaft connected thereto so as to rotate therewith, a second extension shaft likewise arranged in



said bearing housing in axial alignment with said driven transmission output shaft and connected thereto so as to rotate therewith, a second transmission housing detachably connected to said bearing housing, an output shaft arranged in said second transmission housing in axial alignment with said first extension shaft and being connected to said first extension shaft to cause the latter to rotate therewith, a first axial bearing associated with that end of said last mentioned output shaft which faces said first extension shaft for absorbing axial forces exerted upon said driving transmission output shaft in the direction toward said second transmission housing, and a second axial bearing arranged in said bearing housing and associated with said second extension shaft for absorbing axial forces exerted upon said driven transmission output shaft in the direction toward said second transmission housing.

4,144,776

CHANGE-SPEED PLANETARY TRANSMISSION

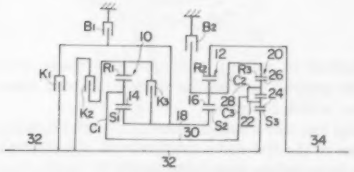
Takahiro Yamamori, Tokyo, and Kunio Ohtsuka, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 8, 1977, Ser. No. 858,903

Claims priority, application Japan, Dec. 13, 1976, 51-148797

Int. Cl.[2] F16H *57/10*

U.S. Cl. 74—759 **4 Claims**



1. A change-speed transmission, comprising:

a first basic planetary gearset having three rotary elements which are a sun gear, a carrier and a ring gear;

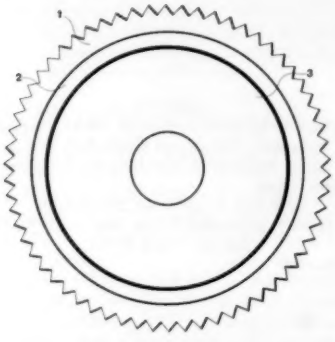
a second basic planetary gearset which has a sun gear, a carrier and a ring gear;
a dual intermeshed planet pinion planetary gearset which has a sun gear, a carrier and a ring gear;
said sun gears of said first and second basic planetary gearsets being connected with each other for simultaneous rotation;
an input shaft;
an output shaft;
said carriers of said first basic planetary gearset and said dual intermeshed planet pinion planetary gearset being connected with each other for simultaneous rotation;
said carrier of said second basic planetary gearset and said ring gear of said dual intermeshed planet pinion planetary gearset being connected with each other for simultaneous rotation;
said sun gear of said dual intermeshed planet pinion planetary gearset being connected with said input shaft for simultaneous rotation therewith;
said ring gear of said second basic planetary gearset being connected with said output shaft;
first clutch means for connecting said sun gears of said first and second basic planetary gearsets with said input shaft;
second clutch means for connecting said ring gear of said first basic planetary gearset with said input shaft;
third clutch means for connecting two of said three rotary elements of said first basic planetary gearset together;
first brake means for braking said sun gears of said first and second basic planetary gearsets; and
second brake means for braking said carrier of said second basic planetary gearset and said ring gear of said dual intermeshed planet pinion planetary gearset.

4,144,777

CIRCULAR SAW BLADE AND METHOD FOR MAKING THE SAME

Lars I. Nyström, and Bengt Lagerström, both of Lidköping, Sweden, assignors to Sandvik Aktiebölag, Sandviken, Sweden

Filed Sep. 28, 1977, Ser. No. 837,424
Claims priority, application Sweden, Sep. 28, 1976, 7610700
Int. Cl.[2] B23D *63/00*
U.S. Cl. 76—112 **12 Claims**



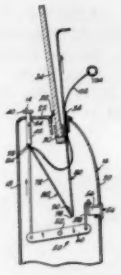
1. Method of making a circular saw blade composed of different materials and having three concentric zones welded together, which comprises
placing together a straight band of material forming an outer zone of the saw and a straight band of a material forming an intermediate zone lying inside the outer zone;
joining the two straight bands together by welding to form an intermediate product;
bending the resulting intermediate product to a circular form;
placing the circular intermediate product around a circular disc of material forming an inner zone of the circular saw blade; and
joining said product and said disc together by a welding method thereby forming a circular saw blade.

4,144,778

TOOL FOR LIFTING A LATCH OPERATOR OF A LOCKED VEHICLE DOOR

Ben Waring, 3230 Crystal Ct., Miami, Fla. 33133

Filed Mar. 13, 1978, Ser. No. 885,809
Int. Cl.[2] E05B *63/00*
U.S. Cl. 81—3 R **3 Claims**



1. A tool for moving a latch operator to unlock a lock mechanism of a vehicle door having an inside and an outside surface and having a window opening defining a window ledge surface bounding the opening with a mouth entrance of slit-type for sliding passage of a window pane into an out of spanning relation of the opening and a slidable window pane sized to span the opening and having a lower edge at all times between the door surfaces, guide means connecting the window pane and the door and constraining the window pane to movement through the slit into and out of closing relation of the opening, the lower window ledge surface having a hole between the window pane and the inside door surface and the latch operator having an upper end at all times above the ledge surface and a lower end below the ledge surface and between the door surfaces, the latch operator being sized for vertical movement in said hole between an unlocked elevated position and a locked lower position, the lock mechanism being mounted between the door surface and including a lock cylinder and barrel means mounted to the door and having an exteriorly accessible keyhole to accommodate a key for turning the lock cylinder and movable means connecting the latch operator and the lock cylinder barrel means and including a force transmitting push rod connected to the lower end of said latch operator; and
said tool comprising:
an elongate strip of spring steel having a main smooth, flat inside and an outside surface with longitudinally extending edges, said strip being bent back upon itself defining a bent zone across the strip perpendicular to the edges and an operator length on one side of the bent zone and a latch manipulating length on the other side of said bent zone, said operator length having an upper end and the zone adjacent said upper end comprising handle means on the upper end and said operator length being of a first predetermined length between the bent zone and said upper end, said latch manipulator length having an upper end defining an edge and being of a second predetermined length less than said first predetermined length, said bent zone defining a normal included crotch angle between the length of less than 90° and greater than 45° and said strip length being yieldable in response to a compressive force applied to the exterior surfaces to bring the inside surfaces into close adjacent generally parallel relation for slipping the bent zone and generally parallel lengths in the slit of the window ledge surface between the window pane and

the exterior door surface and inserting the tool depthwise between the door surface a distance greater than said second predetermined length until said upper end of said manipulating length is beneath the lower edge of said window pane and the energy stored in said bent zone by said compressive force is released and said latch manipulating length moves to its normal position with said upper edge in engagement with said force transmitting push rod and said tool being adapted to be moved upwardly to bring the said edge at said upper end into engagement with the lower end of the latch operator member to lift the latch operator and unlock the door; and a tether string having a first end and means connecting the first end to the manipulator length adjacent said edge at said upper end to pull the upper end toward the inside surface of said operator length to apply a tension force to generally realign the lengths parallel to one another for lifting of the tool from between the window pane and the outside surface.

4,144,779

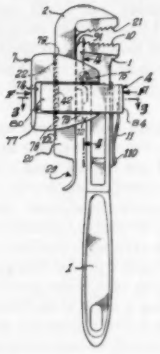
PIPE WRENCH

Cecil W. Honick, 4008 W. Ave. 43, Los Angeles, Calif. 90041

Continuation-in-part of Ser. No. 704,110, Jul. 9, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,375

Int. Cl.[2] B25B *13/28*

U.S. Cl. 81—103 **5 Claims**



1. A pipe wrench comprising:

a handle with a stationary lower jaw portion;

a movable upper jaw with a depending stem portion extending downward alongside the back of said handle;

rack-like stem teeth along the rear surface of said stem, the front and side surfaces thereof being substantially smooth;

a sleeve pivoted rockably to a jaw-adjacent wide portion of said handle at a single pivot point below the rear portion of said lower jaw, said sleeve having:

space for said stem portion to pass slidably through said sleeve,

extended rear inner flat surfaces slidably against said stem teeth,

a slider block clearance space between said surfaces,

a rear bridge portion over said space providing a continuous outer rear surface,

an internal cross-member with its rear surface providing a close sliding fit against the front surface of said stem portion, and

a wide shallow slider groove along the major portion of each side;

a slider with side portions sliding confined in said grooves and thereby constrained against angular displacement with respect to said sleeve, and further comprising:

a slider block fastened between said side portions at the rear thereof and inside said clearance space and having teeth engagable with said stem teeth to lock said jaws at a desired opening; and

a front strap portion connecting said side portions to close the front of said slider and extending beyond and enclosing said stem portion of said handle,

said rear bridge and front strap portions lying substantially opposite each other along a line substantially perpendicular to said handle.

4,144,780

MEANS FOR CONTROLLING THE FEED RATE OF A WORK PIECE IN A NUMERICALLY CONTROLLED NIBBLING MACHINE

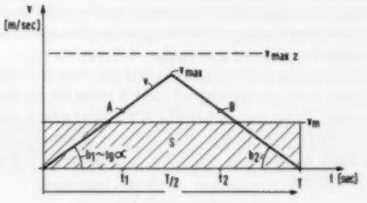
Günter Brömer, Spardorf, and Wolfgang Kanzler, Böblingen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 24, 1976, Ser. No. 744,883

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2556108

Int. Cl.[2] B26D *3/00*; B23D *27/00*

U.S. Cl. 83—71 **6 Claims**



1. In a numerically controlled nibbling machine including means for controlling the feed rate of the work piece with respect to the work tool of the machine and in which the feed distance of the work piece is limited by a release time during which the work tool is disengaged from said work piece according to a predetermined number of strokes of the work tool per unit of time, the improvement comprising,

means for determining said release time of said work tool in a single stroke of said work tool for any number of strokes of said tool, and

means for automatically determining minimum accelerations and decelerations of said work piece required for travelling said feed distance and for forming a desired feed rate value for said work piece from the determined release time of said work tool and the feed distance of said work piece per stroke.

4,144,781

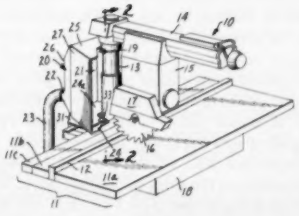
DUST COLLECTOR FOR RADIAL ARM SAWS

Lloyd D. Kreitz, Box 60, Peguot Lakes, Minn. 56472

Filed Jan. 30, 1978, Ser. No. 873,360

Int. Cl.[2] B27B *5/20*; B27G *3/00*; B26D *7/18*

U.S. Cl. 83—100 **11 Claims**



1. In combination with a radial arm saw assembly compris-

ing a saw base, a vertical column positioned within the perimeter of said base at the rear thereof, a horizontal worktable positioned on said base in front of said column, said worktable including a front table and a rear table separated by a rip fence, a spacer board located at the back of the rear table, a horizontal arm rotatably attached to the upper end of said column so as to be positioned over said worktable, a rotary saw carried by said arm, a dust collector positioned at the rear of said worktable, said collector comprising a generally flat-bottomed funnel-shaped shroud having a wide inlet which opens toward the front of said worktable and a narrow outlet for connection to a vacuum hose, said inlet being positioned entirely above the plane of said worktable, a platform positioned so that a portion thereof rests on the spacer board and extends rearwardly therefrom, said shroud being positioned on top of said platform,

the improvement which comprises said platform constructed with a generally U-shaped opening at its forward edge to permit it to surround the column on both sides and the rear, the bottom and top of said shroud both being constructed with generally U-shaped openings in their respective forward edges to permit said shroud to surround said column at both sides and the rear, a pair of clips firmly but adjustably connecting the floor of the shroud to the platform, and platform-supporting means connecting the platform to the saw base,

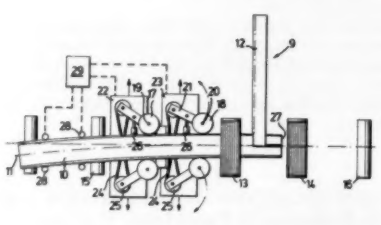
whereby the shroud extends beyond the forward edge of the column and can be rotated over a wide arc to align with the saw blade, even when the horizontal arm is positioned over the left half of the table, thereby enhancing the effectiveness of the dust collector in capturing sawdust and wood chips.

4,144,782

APPARATUS FOR CURVED SAWING OF TIMBER

Nils E. Lindstrom, Karlstad, Sweden, assignor to Skogsagarnas Vanerindustrier Aktiebolag, Karlstad, Sweden

Filed Feb. 8, 1977, Ser. No. 766,783
Claims priority, application Sweden, Feb. 16, 1976, 7601708
Int. Cl.[2] B27B *31/00*
U.S. Cl. 83—102.1 **7 Claims**



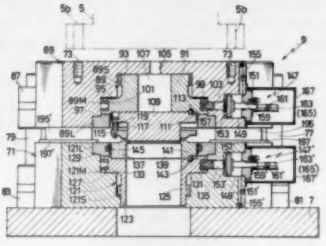
1. Apparatus for sawing of curved-formed timber by means of a saw cut which as closely as possible follows the curved form of the log, which apparatus comprises a band saw and a horizontal feeder path associated therewith and provided with feeder rollers for feeding the log past the band saw, characterized in that the apparatus is provided with means for guiding the log in a curved-formed path past the band saw, comprising at least two spaced guide means providing guide points determining the curved-formed path along which the log is guided, at least one of which guide means comprises two mutually positively guided and vertically mounted guide rollers provided on respective sides of the log and having means for forcing said rollers to the sides of the log, the at least one pair of guide rollers being mounted on a carriage which is displaceable transversely to the moving direction of the log and can be locked in any selected position, and which carriage can be moved transversely also during the sawing operation.

4,144,783

APPARATUS FOR BLANKING SHEET MATERIALS

Kazuya Yamazaki, Tokyo, and Mikio Yonekura, Minamiashigara, both of Japan, assignors to Amada Company, Limited, Kanagawa, Japan

Filed Mar. 15, 1977, Ser. No. 777,783
Claims priority, application Japan, Mar. 15, 1976, 51-27865
Int. Cl.[2] B26F *1/02*
U.S. Cl. 83—216 **5 Claims**



1. Apparatus for blanking sheets comprising:

a press;

a blanking die including an upper die holder mounted to said press and a lower die holder mounted to said press beneath said upper die holder, said upper and lower die holders having upper and lower rotary members detachably supporting upper and lower dies, respectively;

means vertically reciprocating one of said upper and lower die holders relative to each other into sheet blanking cooperation;

means associated with each of said upper and lower die holders and dies for rotating said upper and lower dies independently of one another and relative to said upper and lower die holders, respectively, said rotating means including a circumferential gear arranged about each rotary member, a hydraulic cylinder fixed to each of said die holders, each cylinder including a piston formed as a rack, the rack of each cylinder being engageable with the circumferential gear of its associated rotary member; and

means for positioning a sheet to be blanked relative to said blanking die from a first processing position into a plurality of processing positions according to one of a plurality of predetermined processing patterns, said one processing pattern including numerical values of a starting position on an X axis and a Y axis, a pitch Px on said X axis, a pitch Py on said Y axis, a blanking number Nx on said X axis, blanking number Ny on said Y axis and a displacement Cx on said X axis of a second processing poition of said sheet.

4,144,784

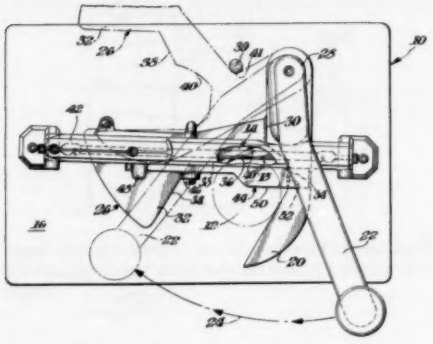
SAFETY GUARD FOR MANUAL FOOD SLICER

Frank W. Jones, Wilmington, Del., assignor to Redco, Inc., Del.

Filed Feb. 24, 1978, Ser. No. 880,898
Int. Cl.[2] B26D *4/20, 4/18*
U.S. Cl. 83—425.3 **7 Claims**

1. A safety guard for a manual food slicer comprising a base frame, a parallel rack of blades having sharp edges mounted on the base frame, a pusher having a parallel array of planar segments, movable connecting means mounting the pusher segments on the base frame for movement from an open position deployed in front of the sharp edges of the blades to the closed positions in which the segments are intermeshed between the blades for receiving an object to be sliced between them in the open position and for pushing the object in a slicing action through the blades in closed positions, a set of auxiliary parallel planar segments connected to the array of pusher segments and leaving a space therebetween large enough to allow the object to be sliced to be readily inserted between the pusher segments and the auxiliary segments, and the auxiliary

segments having relatively blunt edges disposed in front of the sharp edges of the blades when the pusher and auxiliary pusher segments are deployed in the open position whereby they



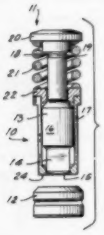
prevent an operator's fingers from contacting portions of the sharp edges of the blades in front of which the blunt edges are disposed.

4,144,785

PARTING TOOL

Vitmar G. von Langendorff, Tonawanda, N.Y., assignor to Houdaille Industries, Inc., Fort Lauderdale, Fla.

Filed Feb. 2, 1978, Ser. No. 874,470
Int. Cl.[2] B26F *1/14*
U.S. Cl. 83—685 **8 Claims**



1. A parting tool punch including a punch body having a projected working tip of substantially elongated rectangular cross section having relatively short end walls and relatively long side walls, the tip terminating in a free bottom end, the bottom end having a convex radius curvature from end wall to end wall and relatively flat surface from side wall to side wall, the tip having a central peak generated by said radius curvature, the peak having a maximum height differential from end wall to the central peak, the maximum height being less than a predetermined penetration depth of the punch tip when the punch tip is used in a punch apparatus in association with a mating die.

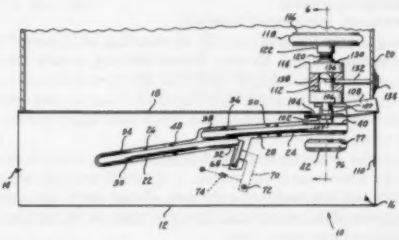
4,144,786

ENVELOPE EDGE SLITTING APPARATUS

James D. Beard, Independence, and Gene F. Beck, Parkville, both of Mo., assignors to Stephens Industries, Inc., Lenexa, Kans.

Continuation of Ser. No. 679,560, Apr. 23, 1976, abandoned.
This application Nov. 1, 1977, Ser. No. 847,499
Int. Cl.[2] B26D *1/24, 7/06;* B65B *43/12;* B65H *3/04*
U.S. Cl. 83—732 **5 Claims**

1. In an apparatus for slitting the edges of envelopes including a base plate having a feed end for accepting a stack of said envelopes, a cutting end, and a slot formed therein running from said feed end toward said cutting end, an edge guide disposed along a lateral edge of said base plate, an endless belt, first and second pulleys supporting said endless belt in said slot, means for rotating said pulleys to move said envelopes along said base plate from the feed end toward the cutting end thereof, and means adjacent to said edge guide at said cutting



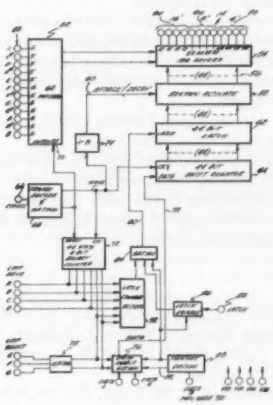
end for slitting an edge of an envelope supplied thereto, the improvement comprising an auxiliary roller for urging envelopes against said edge guide and means for rotatably mounting said roller in rolling contact below said base plate with a portion of said belt trained around said second pulley and with said auxiliary roller directed at least partly toward said edge guide.

4,144,787

KEYER CIRCUIT FOR ELECTRONIC ORGAN

John W. Robinson, and Ralph N. Dietrich, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Nov. 14, 1977, Ser. No. 851,069
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **28 Claims**



1. In an electronic organ having a plurality of playing keys forming a keyboard and tone generator means for producing a plurality of tone signals, a keyer system comprising:

a plurality of keyer means including tone output terminals for placing selected ones of said tone signals on said output terminals,

data input means including a plurality of data input terminals for receiving a plurality of streams of time division multiplexed serial binary data representative of depressed keys on said keyboard and for combining said input data streams into a single internal time division multiplexed serial binary data stream,

means for demultiplexing said internal data stream and for controlling said keyer means to connect to said output terminals tone signals corresponding to depressed keys on said keyboard, said demultiplexing means including a clock input and a latching input,

clock means for producing a plurality of time sequential clock pulses, said clock means being operatively connected to said demultiplexing means clock input,

counter means clocked by said clock means for producing external time division multiplexing scanning signals and an internal latch command signal synchronized with said scanning signals,

an external latch input terminal,

gating means for alternatively connecting said internal latch command signal to said demultiplexing means latching input when said keyer system is in a first mode of operation and said external latch input terminal to said demultiplexing means latching input when said keyer system is in a second mode of operation,

means for enabling all of said data input terminals to receive data when said keyer system is in said first mode of operation and for enabling only one of said input terminals to receive data when said keyer system is in said second mode of operation, and

mode select terminal means operatively connected to said gating means and said means for enabling for placing said keyer system alternatively in said first or second modes of operation.

22. A keyer circuit for an electronic organ, said keyer circuit being in the form of a single integrated circuit chip having external input and output pins and comprising:

a plurality of keyer means providing selected tone signals on certain ones of said chip output pins,

counter means for producing external multiplexer scanning signals on certain other ones of said chip output pins,

a plurality of said pins forming data input pins,

means for combining time division multiplexed data on said data input pins into a single stream of time division multiplexed data,

one of said input pins forming a clock input pin adapted to receive clock input signals,

means synchronized with said counter means and said clock input signals for demultiplexing said single stream of data and for controlling said keyers in response to said single data stream to provide selected tones on said certain ones of said chip pins,

one of said chip input pins forming a latch input pin adapted to receive latch input signals, said

mode select means having an input terminal external to said chip for overriding said counter means and synchronizing said demultiplexing means with said latch input signals when a selected control signal is present on said mode select means input terminal.

4,144,788

BASS NOTE GENERATION SYSTEM

Angelo A. Bione, Chicago; Robert J. Sehnert, Palatine, and Horace E. Taylor, Skokie, all of Ill., assignors to Marmon Company, Chicago, Ill.

Filed Jun. 8, 1977, Ser. No. 804,739
Int. Cl.[2] G10H *5/00*
U.S. Cl. 84—1.01 **84 Claims**

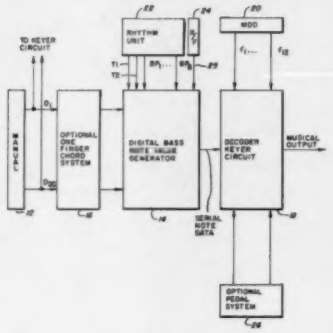
1. An electronic organ having at least one keyboard, a keyer circuit, a plurality of keying lines connecting said keyboard to said keyer circuit, a bass note generation system connected in parallel to at least some of said keying lines and comprising:

a chord recognition circuit for receiving input data from at least some of said keying lines and providing a first output signal representing the type of normalized chord pattern of said input data and a second output signal representing the chord key of said input data;

a bassline pattern memory for storing a plurality of normalized precomposed basslines;

said bassline pattern memory being addressed by said first and second output signals from said chord recognition circuit for selecting one of said plurality of precomposed basslines as a bassline output;

an output circuit for receiving and adding said normalized bassline output and said second output signal from said chord recognition circuit to obtain a bass note value output in the chord key of said input data; and,



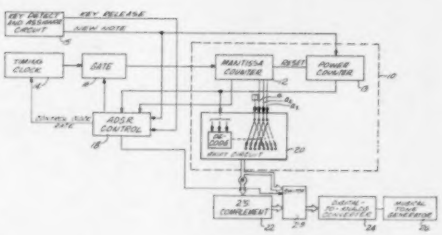
a decoder-keyer circuit responsive to said bass note value output for providing a bass note musical output.

4,144,789

AMPLITUDE GENERATOR FOR AN ELECTRONIC ORGAN

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Jun. 6, 1977, Ser. No. 803,447
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **10 Claims**



1. An ADSR generator for providing a modulating signal to a musical tone generator wherein the generator includes means to modulate the envelope of the audio signal produced by the tone generator, the ADSR generator comprising multiple bit binary counter means including a low order section and a high order section, means including a clock source for counting the counter means, shift means receiving the binary contents of the low order section of the counter means, and means shifting the shift means by a number of bits equal to the count of the high order section of the counter means.

4,144,790

CHORAL GENERATOR

Michael A. Suchoff, Chestnut Hill, Mass., assignor to Arp Instruments, Inc., Lexington, Mass.

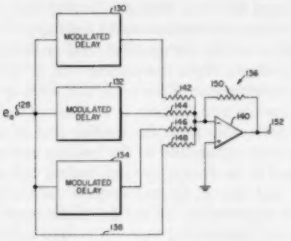
Filed Feb. 14, 1977, Ser. No. 768,600
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **10 Claims**

1. In a choral generator having a plurality of delay lines forming a corresponding plurality of delay channels for delaying a signal applied in common thereto, the improvement comprising a separate independed delay modulator for each said delay line, each modulator comprising

A. a clock connected to drive a corresponding one of said delay lines at a rate determined by a control input applied thereto,

B. an oscillator providing a time-varying output signal, and

C. driving means connected to receive said oscillator output



signal and providing to the control input of said clock a driving signal that is a non-linear function of said output signal.

4,144,791

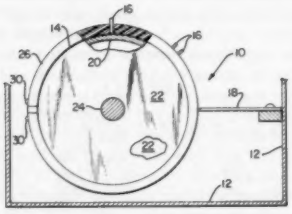
MUSIC BOX WITH SELECTIVELY PROGRAMMABLE DRUM

Carlos W. Veach, 8921 Ashcroft Ave., Los Angeles, Calif. 90048

Filed May 15, 1978, Ser. No. 905,987

Int. Cl.[2] G10F *5/04*

U.S. Cl. 84—96 **9 Claims**



1. In a music box of the type including a rotatable cylindrical drum with music note actuating pins projecting from the peripheral surface thereof, the pins being selectively attachable to the drum in a desired pattern whereby different musical compositions may be played, the improvements, in combination, comprising;

(a) an annular pin supporting member of substantially uniform thickness disposed on the peripheral surface of the drum,

(b) said member being formed of material having a relatively low modulus of elasticity compared to metal,

(c) said member having a plurality of spaced transverse rows of identical apertures extending therethrough,

(d) each aperture being defined by at least three flat intersecting surfaces forming a cylindrical space of uniform polygonal cross section, and

(e) a plurality of identical circular cylindrical pins of uniform diameter and length,

(f) each pin being of a diameter such that it may removably engage intersecting surfaces of an aperture only at their central portions and with an interference fit therewith,

(g) the outer surface of the drum forming a stop for the inner end of each pin.

4,144,792

PIANO PLATE

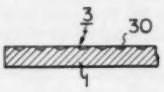
Kazuo Maehara, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 4, 1977, Ser. No. 774,698

Claims priority, application Japan, Mar. 11, 1976, 51-25624

Int. Cl.[2] G10C *3/08*

U.S. Cl. 84—188 **12 Claims**



1. An improved piano plate comprising;

a plate portion;

a plurality of beams coupled to said plate portion;

means formed in said plate portion for receiving string supporting pins; and

said plate portion having an outer surface, said outer surface having a plurality of fine recesses formed therein, said recesses each having a predetermined shape and being distributed along a predetermined pattern.

4,144,793

STRINGED INSTRUMENT CONSTRUCTION EMPLOYING AN INTEGRAL, HOLLOW, ONE PIECE BODY PORTION

Emil H. Soika, 2312 E. Grand Ave., Lindenhurst, Ill. 60046, and Robert R. Genc, 117 E. Grove, Mundelein, Ill. 60060

Filed Jun. 20, 1977, Ser. No. 808,191

Int. Cl.[2] G10D *1/08, 3/02*

U.S. Cl. 84—291 **5 Claims**

1. A body portion or sound box adapted for use with a stringed instrument, said body comprising a relatively homogeneous continuous side wall, bottom wall and top wall integrally formed together to provide a seamless, hollow, one piece body, said body being formed, without any separate structural support, of a synthetic material selected from the group consisting of polyurethane, polyester or epoxy, the internal configuration at the juncture of said walls comprising a radius which is the result of a continuous non-intersecting internal surface and including a neck saddle formed in the end thereof for receiving the neck of a stringed instrument.

4,144,794

DEVICE FOR AND METHOD OF REMOVABLY SECURING A HARNESS TO A MUSICAL INSTRUMENT

Allen B. Silverman, 100 Eldrige St., Mill Valley, Calif. 94941, and Donald O. Collins, 15 Fountain, San Francisco, Calif. 94114

Filed Jun. 9, 1978, Ser. No. 903,684

Int. Cl.[2] G10G *5/00*

U.S. Cl. 84—327 **4 Claims**

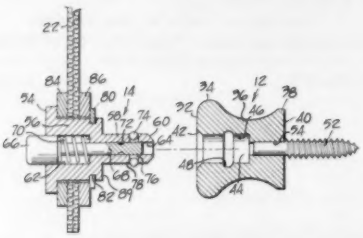
1. A device for removably securing a harness to a musical instrument, comprising:

a receptacle assembly having a chamber therein and attached to a musical instrument,

a pin member having a projecting portion, a flange and a retaining clip,

two enlarged members between said flange and said retaining clip,

a harness attached to said pin member intermediate said enlarged members, and



means for selectively engaging said projecting portion within said chamber and allowing for rotatable movement therebetween.

4,144,795

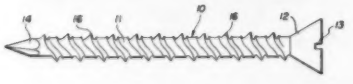
LONG-PITCH RE-ROLLED CREST THREAD

Charles E. Gutshall, 2911 E. State St., Rockford, Ill. 61108

Filed Oct. 20, 1977, Ser. No. 843,720

Int. Cl.[2] F16B *23/00*

U.S. Cl. 85—48 **5 Claims**



1. A rolled screw formed from an elongated cylindrical blank of predetermined diameter, said screw comprising:

an elongated shank having a work-entering end and a head end;

a helical thread on said shank, the crest diameter of said thread being larger than the diameter of said blank and the root diameter of said thread being smaller than the diameter of said blank;

said helical thread having an unsymmetrical contour in a plane including the longitudinal axis of said screw, the flank of said thread facing the head end of said screw being more nearly perpendicular to the axis thereof than the flank facing said work-entering end;

said shank having a helical surface separating adjacent turns of said helical thread, said helical surface having a diameter substantially equal to that of said blank; and

helical crests located at the juncture between said helical surface and said threads adjacent thereto, said crests extending radially outwardly beyond said helical surface.

4,144,796

EXPANSION DOWEL ASSEMBLY WITH SETTING CONTROL

Martin Richter, Freising, Fed. Rep. of Germany, and Josef Entner, Franstanz, Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

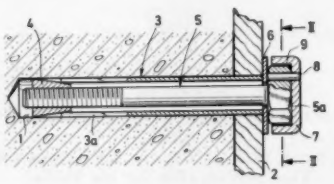
Filed Aug. 2, 1977, Ser. No. 821,151

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1976, 2635805

Int. Cl.[2] F16B *13/06, 31/02*

U.S. Cl. 85—61 **6 Claims**

1. Expansion dowel assembly such as for insertion into a borehole in a receiving material for attaching a load to the receiving material, comprising an axially elongated expanding sleeve forming an axially extending bore therethrough with said sleeve and the bore having a leading end arranged to be inserted first into the borehole and a trailing end at the opposite end thereof, an axially elongated tie rod extending through the bore in said sleeve from the trailing end of the bore at least toward the leading end of the bore, said tie rod having a leading end extending into the bore in said sleeve and a trailing end extending outwardly from the trailing end of said sleeve, an expanding body connected to the leading end of said tie rod and arranged to be drawn into the leading end of the bore for expanding said sleeve, an end support coaxially mounted on said tie rod and located outwardly of the trailing end of said sleeve, torque transmitting means arranged coaxially with and connected to said end support for transmitting torque to said end support, said torque transmitting means being separable from said end support when a predetermined torque is applied to the end support, wherein the improvement comprises that said end support has a plurality of planar working surfaces forming the radially outer circumferential periphery thereof with said working surfaces extending laterally of and around the axis of said tie rod and said working surfaces arranged to



receive a tool so that torque can be applied directly to said end support working surfaces after said torque transmitting means are separated from said end support, said torque transmitting means includes a cap-shaped member to which torque can be applied, said cap-shaped member extending laterally around and enclosing the planar working surfaces on said end support and across the end surface of said end support extending transversely of the axis of said tie rod located more remote from the trailing end of said sleeve, shear pins inserted into and held by said end support and said cap-shaped member and said pins extending in parallel relation with the axis of said tie rod, said shear pins releasably connecting said cap-shaped member to said end support for transmitting torque to said end support until a predetermined torque is attained at which point said pins shear so that if further torque is applied to said cap-shaped member after said pins shear, said cap-shaped member rotates relative to said end support about the axis thereof and can be removed from said end support, said cap-shaped member having a continuous cylindrically shaped inner surface for its axial extent coextensive with said end support with the diameter of the inner surface being greater than the maximum transverse dimenstion of said end support so that said cap-shaped member rotates relative to said end support without any frictional engagement with said end support after said shear pins shear.

4,144,797

DEVICE FOR A TURRET APPLIED TO A TANK

Sven E. Berge, Stockholm, and K. Sten R. Hultgren, Karlskoga, both of Sweden, assignors to AB Bofors, Bofors, Sweden

Continuation of Ser. No. 722,257, Sep. 10, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,643

Claims priority, application Sweden, Sep. 12, 1975, 7510202

Int. Cl.[2] F41F *9/04;* F41G *5/24*

U.S. Cl. 89—41 M **12 Claims**

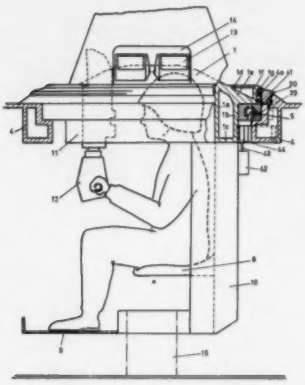
1. An improved turret structure for an armored vehicle comprising:

a low profile turret mounted for traversing movement in said

vehicle, said turret having an upper portion sized to extend only slightly above the top of said vehicle;

a fire-arm carrier mounted on said upper portion of said turret and provided with side portions for supporting a firearm, the vertical height of said side portions substantially exceeding the height of said upper portion;

first box-shaped frame means mounted in said vehicle for supporting said turret for traversing movement in said vehicle;



a crew support station suspended from said turret through said frame means and within said vehicle, for traversing movement with said turret;

ring means rotatably mounted on said turret for traversing movement relative to both said turret and said vehicle; and

a loading pendulum pivotably supported on said ring means so that said pendulum may be rotated toward and away from a firearm mounted on said carrier and may traverse with said ring means.

4,144,798

FLUID PRESSURE UNIT WITH HYDROSTATIC TORQUE TRANSMISSION BY ROLLER PISTONS

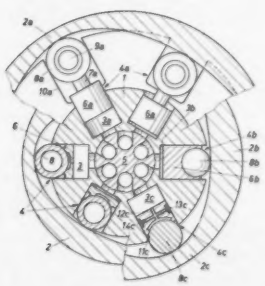
Ivan J. Cyphelly, Neuhaus, Hinteregg, Switzerland (8128)

Filed Jul. 13, 1977, Ser. No. 815,428

Claims priority, application Switzerland, Jul. 15, 1976, 9111/76; Jun. 14, 1977, 7303/77

Int. Cl.[2] F01B *13/06*

U.S. Cl. 91—488 **7 Claims**



1. In a fluid pressure unit having a cylinder block provided with radial bores of rectangular cross-section; pistons disposed in the bores, each of said pistons being provided with a piston cap which is to be subjected periodically to a pressure medium and with a roller resting against the piston cap; and cam means for producing at least one piston stroke per revolution positioned around the cylinder block and upon which the rollers rest, the improvement wherein each said roller, with a first lateral wall of a respective one of said bores which is perpendicular to the direction of rotation, defines a variable throttle space, wherein each of said piston caps forms a respective sealing means with at least a second lateral wall of a respective one of said bores which is perpendicular to the direction of rotation, wherein each said piston cap, in the vicinity of the two lateral walls of a corresponding one of said radial bores which are vertical with respect to the rotational direction, is provided with adjustable sealing strips, and including a respective intermediate pressure space located between one of said variable throttle spaces and one of said sealing strips of a corresponding one of said piston caps and being subjectable to pressure medium via respective leakage spaces between respective other lateral walls of respective ones of said radial bores which are parallel to the rotational direction and respective said rollers and corresponding said piston caps, each of said rollers being hollow, and including channel means which terminate in said lateral walls of said bores which are parallel to the rotational direction for supplying pressure fluid to spaces within said hollow rollers and to said leakage spaces, and wherein each said piston cap is provided with supporting elements to accept tilting moment of the associated piston, said elements resting against surfaces of said cylinder block and being spatially separated from sealing strips provided on the cap.

4,144,799

FLUID MACHINE

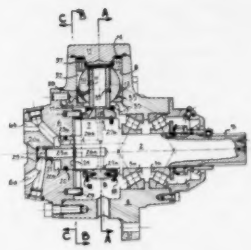
Jean-Luc Ponchaux, La Cure de Petosse, 85570 L'Hermenault (Vendee), France

Filed Jun. 24, 1977, Ser. No. 809,914

Claims priority, application France, Jun. 25, 1976, 76 19341; Canada, Jul. 9, 1976, 256691

Int. Cl.[2] I01B *13/00*

U.S. Cl. 91—488 **9 Claims**

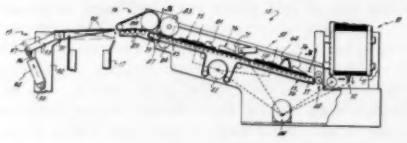


1. A hydraulic machine comprising a plurality of radially extending pistons in a housing, a shaft mounting an eccentric in the housing, means connecting the pistons radially with the eccentric, each piston being mounted for sliding movement within a mobile cylinder, the cylinder havng a spherical outer surface and being retained between a pair of retaining rings, the first retaining ring having a concave spherical surface matching with the spherical surface of the outer surface of the cylinder, means for providing fluid under pressure in an annular sealed zone between the cylinder and the first retaining ring, whereby the first ring functions as a hydrostatic pad for the cylinder, the second retaining ring in the form of a valve seat which is hydrostatically balanced and thus limits the field of pressure which can be established above the cylinder, spring means urging the second ring in contact against the spherical surface of the cylinder, the cylinder thus having an oscillating movement subject to the relative rotation of the shaft relative to the housing, the cylinder being in hydrostatic equilibrium at all positions of its oscillation between the first and second retaining rings, the said cylinders being placed in communication successively with feed means and exhaust means.

4,144,800
APPARATUS FOR FOLDING AND GLUING CARTON BLANKS

Charles C. Hughes, Ludlow, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Continuation-in-part of Ser. No. 690,644, May 27, 1976, Pat. No. 4,056,046. This application Jul. 27, 1977, Ser. No. 819,341
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.[2] B31B *1/56*
U.S. Cl. 93—49 R 6 Claims



1. Apparatus for folding and gluing a blank into a carton having two outboard panels, two inboard panels and a glue flap at the edge of one outboard panel adhesively secured to the edge of the opposite outboard panel, said panels and glue flap being defined by fold lines, said apparatus comprising,

a conveyor for feeding carton blanks in a direction parallel to their folded lines,

a first rotatable plow on one side of said conveyor for folding said glue flap and outboard panel over upon said one outboard panel,

conveyor means on the other side of said conveyor opposite said first rotatable plow for tightly gripping the upper and lower sides of said one outboard panel to convey said blank past said first rotatable plow while holding said blank securely in longitudinal alignment,

means upstream of said rotatable plow for applying glue to an edge of said blank,

a second rotatable plow located downstream of said first rotatable plow and on the opposite side of said conveyor from said first rotatable plow for folding said opposite outboard panel on the other side of said blank over upon said blank with an edge portion overlying the glue flap of the first panel,

conveyor means securely gripping the upper and lower surfaces of said folded blank and located on the side of said conveyor opposite to said second rotatable plow to securely grip said blank and maintain it in longitudinal alignment,

and means downstream of said rotatable plow for pressing said edge portion and glue flap together with said applied glue therebetween.

4,144,801
METHOD AND APPARATUS FOR TRANSPORTING AND HOUSING TUNNEL WORKERS ACTIVE IN HIGH PRESSURE ENVIRONMENTS

Kenneth W. Wallace, Gretna, and Anthony V. Gaudiano, Metairie, both of La., assignors to Taylor Diving & Salvage Co., Inc., Belle Chasse, La.

Filed Oct. 20, 1977, Ser. No. 843,968
Int. Cl.[2] E21F *5/00*
U.S. Cl. 98—1.5 12 Claims

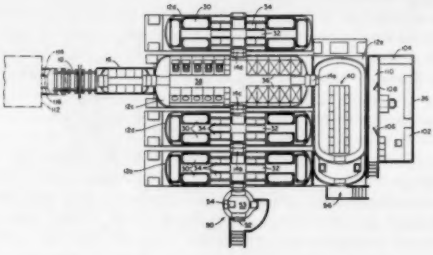
1. Apparatus to house and transport tunnel workers engaged in work in a tunnel work area having a high pressure environment, said pressure being sufficiently high to require that decompression procedures be employed to return the workers to an atmospheric pressure environment at the end of a work day comprising

a pressurized life support chamber to house said workers over a plurality of working days, during non-work hours,

a pressure maintaining apparatus for maintaining said life support chamber at an intermediate pressure greater than atmospheric pressure and less than said high pressure,

a pressurized vehicle means to transport workers between said life support chamber and the work area,

said pressurized vehicle means and said life support chamber each having a connection means adapted to form a pressure tight seal between said chamber and said vehicle



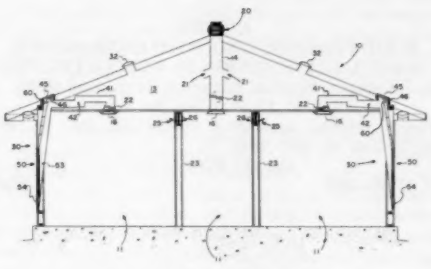
means whereby workers can transfer between said chamber and said vehicle means, and

said pressurized vehicle means and a tunnel face each having second connection means to form a pressure tight seal between the tunnel face and the vehicle means whereby workers can transfer between said vehicle means and said tunnel face.

4,144,802
HURRICANE/TORNADO BUILDING PROTECTION SYSTEM

Paul A. Babin, Rm. 760, Delta Towers, 1732 Canal St., New Orleans, La. 70112

Filed Jan. 19, 1977, Ser. No. 760,513
Int. Cl.[2] F23L *17/00*
U.S. Cl. 98—119 11 Claims



1. A pressure relief roof vent system for a building having an attic which is at least generally shut off from and located above the usable interior of the building, comprising:

a. an air conveying duct mountable through the roof portion of the building and extending from the lower usable interior of the building through the attic and to the exterior of the building and through the roof of the building, said air duct provided with openings at its respective end portions, allowing air to flow through said air duct from a lower end portion communicating with the usable interior of the building to the other, upper end portion thereof communicating with the exterior, the lower opening attachable to an opening in the interior portion of the building, the other end portion of said air duct providing an outlet through said roof;

b. normally open side duct means located in the attic of the building on said air duct and in air flow communication therewith between the end portions of said air duct for

allowing hot air in the attic to enter said air duct through said side duct means and exit to the exterior; and

c. normally closed valve means in said air duct below said side duct means for releasing air to flow through said air duct from the useable interior, said valve means being automatically actuated to an open position by a large pressure differential existing on the opposite sides of said valve means within said air duct between the interior and the exterior of the building such as occur in hurricanes and tornadoes.

4,144,803

PASSENGER SPACE VENTILATION FOR MOTOR VEHICLES, ESPECIALLY FOR PASSENGER MOTOR VEHICLES

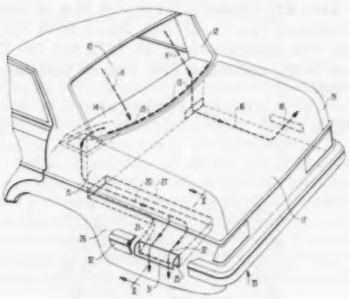
Hans Götz, Böblingen; Albert Hack, Sindelfingen, and Hans Winz, Horb-Isenburg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 26, 1977, Ser. No. 762,518

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603297

Int. Cl.[2] B60H *1/24*

U.S. Cl. 98—2.18 **38 Claims**



1. A passenger-space ventilation system for a motor vehicle, in which used-up passenger-space air is conducted from a passenger-space toward the outside atmosphere through openings in a rear area of a vehicle body, characterized by:

means, arranged in the passenger-space, for discharging used-up passenger-space air out of the passenger-space,

means, connected at one end to said discharging means, for conducting the used-up passenger-space air past heated-up vehicle parts for purposes of cooling the same, said conducting means including a first section having means for conducting the used-up passenger-space air through the gas tank space which is located between the passenger-space and a luggage space and further including a second section having an open-bottomed air conductor channel extending on a top of a floor of the luggage space provided above an exhaust system, and

means, connected to the other end of the conducting means and arranged in the rear area of the vehicle body, for discharging the used-up passenger-spaced air into the outside atmosphere.

38. A method of ventilating air from a passenger-space in a motor vehicle, comprising the steps of:

a. discharging used-up passenger-space air out of a passenger space,

b. conducting the used-up passenger-space air through a gas tank space located between the passenger-space and a luggage space,

c. conducting the used-up passenger-space air into an open-bottomed air conductor channel extending on a top of a floor of the luggage-space provided above an exhaust system,

d. conducting the used-up passenger-space air past heated-up vehicle parts,

e. cooling the heated-up vehicle parts by the used-up passenger-space air, and

f. discharging the used-up passenger-space air into the outside atmosphere.

4,144,804

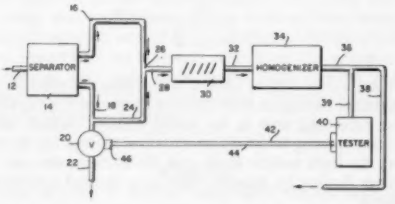
APPARATUS FOR CONTINUOUSLY CONTROLLING BUTTERFAT CONTENT OF RECONSTITUTED MILK

Michael G. O'Keefe, Hopewell Junction, and Richard Oberrieth, Beacon, both of N.Y., assignors to On-Line Instrumentation, Inc., Hopewell Junction, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,467

Int. Cl.[2] A23C *9/00*; G01N *33/06*; G05D *11/02*

U.S. Cl. 99—452 **10 Claims**



1. In a milk processing system within a closed loop milk standardization line wherein heat-treated milk is initially separated into high-fat and low-fat milk with the high fat milk being fed through a first high-fat line and the low-fat milk being fed through a separate second milk line to a junction line at which selected proportions of said high-fat and low-fat milk combine and mix as a reconstituted milk blend which is fed to a homogenizer and then to an outlet line,

a monitoring and closed-loop control apparatus for measuring and controlling the butterfat content of the reconstituted homogenized milk blend,

said monitoring and control apparatus comprising a digitally-controlled modulator valve located in said high-fat line and being operable to selectively restrict and enlarge the valve port thereof to vary the volume of high-fat milk flowing through said high-fat line to said junction line,

monitoring means for continuously measuring the butterfat content of a continuously flowing sample of the homogenized milk blend drawn from said outlet line at a point downstream of said homogenizer and under pressure of said homogenizer, and for providing an electrical analog signal corresponding to the measured butterfat content of said sample,

converter means for converting said analog signal to an equivalent measured butterfat digital signal,

comparator means for comparing said measured butterfat digital signal to a pre-set digital reference signal and for producing a corrective digital signal corresponding to the difference between said measured butterfat digital signal and said digital reference signal, and

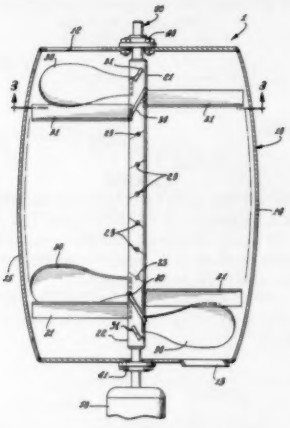
a valve interface connected to said comparator means for receiving said corrective digital signal therefrom, and operable in response thereto to open and close said modulator valve by stepped increments corresponding to the corrective digital signal produced by said comparator means.

4,144,805

NUT HULLER AND/OR SHELLER

Mike M. Cacho, 706 L. St., Bakersfield, Calif. 93304

Filed Jan. 10, 1978, Ser. No. 868,320
Int. Cl.[2] A23N *5/00*
U.S. Cl. 99—568 **12 Claims**



1. A nut huller and/or sheller comprising, in combination:
a container having an inlet opening located at the top thereof for receiving nuts to be hulled and/or shelled, and an outlet opening located at the bottom thereof for discharging the hulls and/or shells and the shelled nuts, said container having its interior wall in a vertical cylinder-like shape;
a vertical, rotatable shaft concentrically mounted within said container, said shaft having an upper and a lower portion;
a plurality of radially extending blades mounted on said shaft to form a rotor assembly, said blades being arranged about said shaft with their outermost ends terminating near said interior wall of said container, but allowing said rotor assembly to freely rotate, said blades being divided into an upper group of blades attached to the upper portion of said shaft in a helix of one direction, and a lower group of blades attached to the lower portion of said shaft in a helix of the opposite direction, said upper group of blades being approximately equal in number to said lower group of blades, each of said blades being mounted approximately perpendicular to the center line of said shaft;
a means for journaling said shaft in said container; and
a means for rotating said rotor assembly.

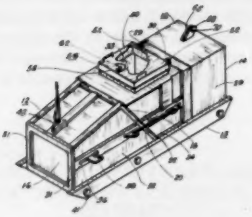
4,144,806

TRASH COMPACTOR FOR INDUSTRIAL USE

Vernon K. Broussard, P.O. Box 558, St. Martinville, La. 70582

Filed Jan. 20, 1978, Ser. No. 870,969
Int. Cl.[2] B30B *15/04*
U.S. Cl. 100—100 **4 Claims**

1. A trash compactor having a piston type compactor and comprising in combination:
(a) a housing means and a trash container means, a skid base means for mounting said housing and container means in horizontal alignment and cooperation, and for limited mobility of the whole;
(b) said housing means being fixed to an end of said skid base means and having a truncated open end and a closed opposite end for housing said piston type compactor therein, and having a longer top side than bottom side in which a trash receiving port is defined adjacent said open end; and
(c) said trash container means slidably mounted on said skid base means and having an only opening, a truncated end, complementary to the open end of said housing means for horizontally joining therewith in a diagonal joint wherein said trash receiving port of said housing means overhangs a bottom portion of said trash container means, thereby



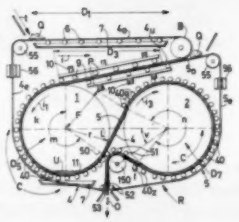
maximizing strength and volume, and minimizing weight, and providing a trash spillage area of and in said trash container means.

4,144,807

DEVICE FOR DEWATERING SLUDGE

Wendel Bastgen, Betzdorf, Sieg, Fed. Rep. of Germany, assignor to Alb. Klein KG, Niederfischbach, Fed. Rep. of Germany

Continuation of Ser. No. 477,413, Jun. 7, 1974, Pat. No. 4,019,431. This application Mar. 16, 1977, Ser. No. 778,251
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1973, 2333680
Int. Cl.[2] B30B *9/24*
U.S. Cl. 100—118 **22 Claims**



1. A device for dewatering sludge in the form of cakes, said device comprising in combination:
a first rotary dewatering drum;
a second rotary dewatering drum disposed side-by-side with said first drum, said drums being rotatable in opposite directions;
two parallel spaced apart filter bands for supporting and conveying sludge cakes placed therebetween, said filter bands being guided around part of the circumferential wall of the first drum for conveying the bands in the rotational direction of the first drum and also being guided around part of the circumferential wall of the second drum for conveying the bands in the rotational direction of the second drum and thus in opposition to the moving direction of the bands while being conveyed around the first drum;
said filter bands being guided around and by said drums to define an apporximately S-shape in an upright plane;
said circumferential walls of the drums being water permeable;
pressure rolls disposed at the walls of the drums for pressing the filter bands against the circumferential wall of at least one of said drums;
said filter bands being guided to constitute a straining and preliminary pressure zone for causing partial dewatering of sludge cakes upstream of said first rotary drum, and

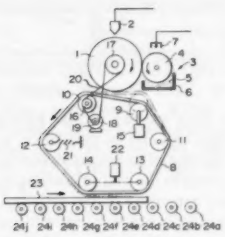
guide rolls at the inlet end of said straining and preliminary pressure zone for guiding the filter bands into said zone.

4,144,808

ELECTROPHOTOGRAPHIC MARKING APPARATUS

Masakazu Iwasa, Tokyo; Seiji Matsumoto; Satoru Honjo, both of Asaka, and Teruo Iida, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 15, 1977, Ser. No. 806,702
Claims priority, application Japan, Jun. 16, 1976, 51-70484; Jun. 16, 1976, 51-70486
Int. Cl.[2] G03G *15/00*
U.S. Cl. 101—1 16 Claims



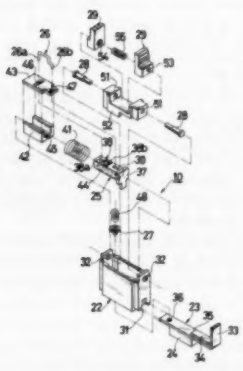
1. An apparatus for print marking steel plates while the steel plates are being fed in a heated condition comprising an endless transfer belt tensioned around a plurality of rollers including a drive roller, means for forming a powder image on the surface of the endless belt, and means for transferring the powder image formed on the surface of the endless belt to the surface of the steel plates, wherein the improvement comprises at least two rollers provided for guiding a part of said transfer belt in parallel to the surface of the steel plates in an image transfer station where the powder image on the belt is transferred to the steel plates, and means for moving said guiding rollers up and down to move the belt apart from and close to the steel plates.

4,144,809

CODE PLATE DEVICE FOR A LABELING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Mar. 14, 1977, Ser. No. 777,539
Claims priority, application Japan, Mar. 15, 1976, 51/27203
Int. Cl.[2] B41F *1/08*
U.S. Cl. 101—288 12 Claims



1. A labeling machine, including a code plate device, wherein said labeling machine comprises:

a machine frame; a printing device supported by said machine frame; a platen on which a label is to be imprinted; means for moving said printing device and said platen together to imprint a label on said platen;

said code plate device comprises:

a casing; casing retaining means for removably attaching said casing to said printing device and for positioning said code plate device such that said code plate device imprints a label on said platen as said printing device imprints that label;

a code plate having an imprint surface and supporting imprintable characters on said imprint surface; said code plate being adapted to be removably inserted into said casing from a position of initial insertion to a position of full insertion;

a sliding assembly in said casing which is positioned to be engaged by said code plate as said code plate is being initially inserted into said casing and which is engaged by and then slid through said casing by said code plate as said code plate is fully inserted in said casing; sliding assembly engagement means held in said casing in engagement with said sliding assembly; said sliding assembly having first and second terminal positions; said first terminal position being the position at which said code plate first engages said sliding assembly upon initial insertion of said code plate into said casing; said second terminal position being the position of full insertion of said code plate into said casing; said engagement means retaining said sliding assembly at either of said first and second terminal positions;

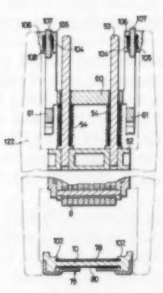
code plate retaining means in said casing for engaging and retaining said code plate in the fully inserted position thereof and at which said sliding assembly is at its said second terminal position.

4,144,810

PORTABLE LABEL PRINTING-DISPENSING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,556
Claims priority, application Japan, Oct. 11, 1975, 50-121783
Int. Cl.[2] B41F *1/08*
U.S. Cl. 101—292 28 Claims



1. A hand labeler, comprising:

a body frame;

a printing device supported on said body frame;

a platen assembly in said body frame including a platen for carrying a label strip; said platen assembly being movably supported and positioned in said body frame such that a label on said platen confronts said printing device;

biasing means connected with said platen assembly for normally biasing said platen toward confrontation with said printing device;

platen assembly motion restraining means connected with said platen assembly for blocking motion of said platen toward confrontation with said printing device under the bias of said biasing means;

a grippable hand lever supported by said body frame and

connected with said restraining means for moving said restraining means off said platen assembly as said hand lever is gripped, whereby said platen assembly is freed to shift for said platen to confront said printing device under the bias of said biasing means;

separation means supported on said body frame, separate from said hand lever and normally separate from said platen, at a position so that the separation means is engaged by said platen only as said platen confronts said printing device for moving said platen off said printing device after their initial confrontation caused by said biasing means; said separation means being positioned for being engaged by said platen while said hand lever is still being gripped.

4,144,811

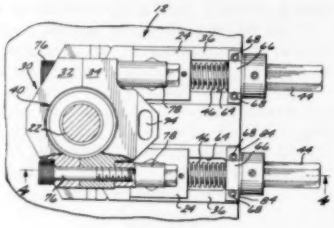
FORM ROLLER COMPENSATOR

Edward R. Barnett, Westminster, Calif., assignor to Beach Manufacturing Corporation, Huntington Beach, Calif.

Filed Dec. 2, 1977, Ser. No. 856,781

Int. Cl.[2] B41L *27/34*; B41F *31/32*

U.S. Cl. 101—349 **8 Claims**



1. Adjustable bearings for mounting a cylinder on a rotatable shaft between upright standards in a printing machine, each comprising:

a pair of vertically separated guides extending horizontally in a plane perpendicular to the axis of said cylinder for attachment to an upright standard, an articulated bearing mount supported by said guide means and comprising

a support yoke having opposing ends and a pair of elongated legs each carried in horizontally adjustable disposition relative to an associated one of said guides and rotatably connected to an associated one of said opposing ends of said support yoke, thereby allowing articulated relative movement of said support yoke and said legs in a plane perpendicular to the axis of said cylinder,

annular bearing means rigidly attached to said bearing mount and disposed to carry an end of said shaft of said cylinder,

adjustable positioning means for separately moving said legs of said bearing mount to selected positions relative to the guide asociated therewith and for holding said bearing mount legs at said selected positions.

4,144,812

PRINTING SLEEVES

Anthony P. Julian, Hambrook, England, assignor to Strachan & Henshaw Limited, Speedwell, England

Continuation-in-part of Ser. No. 755,157, Dec. 30, 1976. This application Jun. 2, 1977, Ser. No. 802,722

Claims priority, application United Kingdom, Jan. 8, 1976, 609/76; Jan. 8, 1975, 700/76; Apr. 4, 1977, 14060/77

Int. Cl.[2] B41F *27/00*

U.S. Cl. 101—382 R **8 Claims**

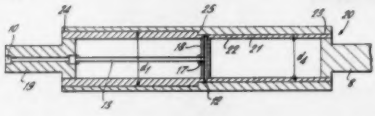
1. A printing roll cmprising

(i) an incompressible core having two axial ends at the end portions of the core

an outer surface of the core having a working length extending between and up to each of the said ends and adapted to receive and support an expansible printing sleeve

the outer surface of the core having end portions of which the respective diameters are different whereby the working length of the outer surface has a minimum diameter and a maximum diameter, the transition between said portions of minimum and maximum diameter comprising a stepped transition

gas outlets in the outer surface, said outlets being located in the working length of the outer surface on the side of the circumference of interference havine the lesser diameter between the sleeve and the core wherein the said circumference of interference is the circumferential



line on the core located at that location on the core beyond which one end of the sleeve, when slid on the core from the end of minimum diameter thereof cannot be moved towards the end of maximum diameter of the core without expansion of the sleeve,

means for passing gas under pressure to said outlets to pass radially outwardly from them and the said sleeve being

(ii) a seamless sleeve, the sleeve being diametrically undersize for the core when in unstressed condition, the sleeve having two axial ends, at least the said one of said ends having in an unstressed condition an internal diameter greater than the said minimum diameter and less than the said maximum diameter of the outersurface of the core.

4,144,813

PRINTING SLEEVES

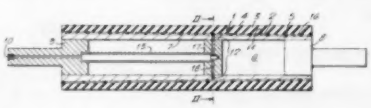
Anthony P. Julian, Bristol, England, assignor to Strachan & Henshaw Limited, Bristol, England

Filed Dec. 30, 1976, Ser. No. 755,757

Claims priority, application United Kingdom, Jan. 8, 1976, 609/76; Jan. 8, 1976, 700/76

Int. Cl.[2] B41F *27/00*

U.S. Cl. 101—382 R **18 Claims**



1. A printing roll comprising

(i) an incompressible core having two axial ends at the end portions of the core

an outer surface of the core having a working length extending between and up to each of the said ends and adapted to receive and support an expansible printing sleeve

the surface of the core having end portions of which the respective diameters are different whereby the working length of the outer surface has a minimum diameter and a maximum diameter

gas outlets in the outer surface said outlets being located in the working length of the outer surface on the side of the circumference of interference having the lesser diameter between the sleeve and the core wherein the said circumference of interference is the circumferential line on the core located at that location on the core beyond which one end of the sleeve, when slid on the core from the end of minimum diameter thereof cannot be moved towards the end of maximum diameter of the core without expansion of the sleeve,

means for passing gas under pressure to said outlets to pass radially outwardly from them and the said sleeve being

(ii) a seamless sleeve the sleeve being diametrically undersize for the core when in unstressed condition, the sleeve having two axial ends, at least the said one of said ends having in an unstressed condition an internal diameter greater than the said minimum diameter and less than the said maximum diameter of the outer surface of the core.

4,144,814

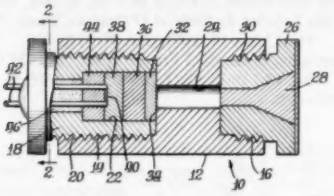
DELAY DETONATOR DEVICE

Edward A. Day, Rancho Santa Fe, Calif.; Glenn E. Seay, Los Alamos, N. Mex., and Perry B. Ritter, Encinitas, Calif., assignors to Systems, Science and Software, LaJolla, Calif.

Filed Jul. 8, 1976, Ser. No. 703,601

Int. Cl.[2] F42B *3/12*; F42C *19/12*

U.S. Cl. 102—28 R **9 Claims**



1. A delay detonator device comprising:

a body having an internal chamber, one end of said chamber communicating with an elongated bore, said end defining an annular shoulder generally concentrically positioned relative to said bore;

an impactor disk abutting said annular shoulder in said chamber and overlying said bore;

a donor secondary explosive charge positioned adjacent said impactor disk within said chamber;

a pyrotechnic delay charge having a slow burning characteristic positioned adjacent said donor charge within said chamber, said delay charge being non-gassing and adapted to burn toward and ignite said donor charge, said donor charge being tightly confined within said chamber between said disk and said delay charge, said non-gassing characteristic of said delay charge being effective to provide said predetermined delay without affecting the tight confinement of said donor explosive by either substantially increasing or decreasing the pressure within said chamber during burning of said delay charge;

igniting means for initiating the burning of said delay charge at the end opposite said donor charge, the deflagration of said donor charge being effective to shear the central portion from said impactor disk and accelerate the sheared central portion down the bore as a unitary piece, the thickness of said sheared portion being generally within the range of about 0.4 to about 0.5 of the diameter thereof to substantially prevent tumbling thereof during travel and also prevent substantial escape of explosive gases between said sheared central portion and the wall of said bore; and,

an acceptor charge of second explosive located downstream of said bore adapted to be detonated upon impact by said sheared central portion of said impactor disk.

4,144,815

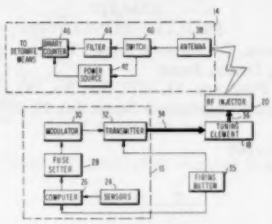
REMOTE SETTABLE FUZE INFORMATION LINK

Allen R. Cumming, Towson, Md., and Clyde O. Peterson, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 5, 1973, Ser. No. 321,405

Int. Cl.[2] F42C *13/00, 15/40, 11/04*

U.S. Cl. 102—214 **10 Claims**



1. A system for supplying setting information from a fire control system to an electronic fuze mounted on a projectile chambered in a gun barrel prior to setback comprising in combination:

a source of microwave energy operated by said fire control system, said source generating microwave signals adapted to supply both DC power and fuze setting data to said fuze; and

means coupling said microwave signals into said gun barrel intermediate the fuze and the muzzle of the barrel, said barrel being utilized as a microwave transmission line thereby.

4,144,816

MISSILE SECURITY MECHANISM

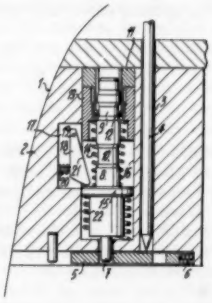
Roger Beuchat, Gland, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Mar. 28, 1977, Ser. No. 782,031

Claims priority, application Switzerland, Apr. 6, 1976, 4284/76

Int. Cl.[2] F42C *1/04, 15/34*

U.S. Cl. 102—251 **2 Claims**



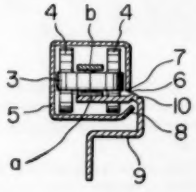
1. A security mechanism for a missile, said mechanism comprising a sliding rod having two axially spaced-apart grooves, a socket slidably mounted on the rod and having hooks able to engage in one of these grooves then the other, and an inertia-block in the form of a sleeve surrounding said hooks to lock them in the groove in which they are engaged, said inertia-block being slidably mounted and biased to the hook-locking position by a first spring and movable under the effect of acceleration of the missile by inertia against the action of the first spring to free the hooks, a second spring biasing the rod in the direction of the socket, and a member for retaining the rod

against the action of the second spring, said member being movable to a position freeing the rod in response to a given displacement of said interia-block by inertia under the effect of acceleration of the missile.

4,144,817
TROLLEY CONVEYOR

Minoru Morita, Tokorozawa, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Apr. 13, 1977, Ser. No. 787,279
Claims priority, application Japan, Jul. 21, 1976, 51-96089[U]
Int. Cl.[2] E01B *25/22*
U.S. Cl. 104—108 **6 Claims**



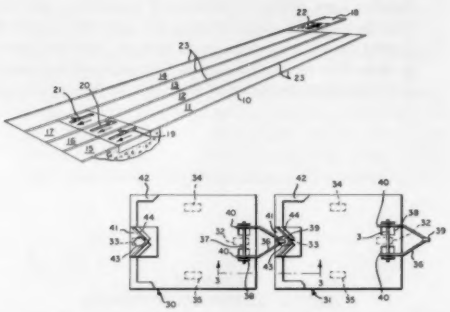
1. A trolley conveyor comprising a hollow guide rail, a conveyor chain disposed within said guide rail and adapted for movement therealong, said hollow guide rail having a narrow continuous longitudinal opening in one sidewall thereof spaced above the bottom of the guide rail, said opening dividing said sidewall into upper and lower sidewall portions, said lower sidewall portion being outwardly inclined so as to protrude outwardly beyond said upper sidewall portion to thereby provide an inwardly sloping surface serving to return to the guide rail any foreign matter falling thereon, a plurality of hangers attached at spaced intervals to said conveyor chain and extending through said longitudinal opening, each said hanger including a projection thereon adjacent the upper edge of said opening to prevent material from flowing along said hanger outwardly through said opening and to effectively reduce the size of the opening above each said hanger.

4,144,818
STORAGE SYSTEM FOR WHEELED BUGGIES AND APPARATUS THEREFOR

Eldon L. Fletcher, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Filed Jun. 30, 1977, Ser. No. 811,984
Claims priority, application Canada, Aug. 16, 1976, 259140
Int. Cl.[2] B61J *3/04*
U.S. Cl. 104—172 B **13 Claims**

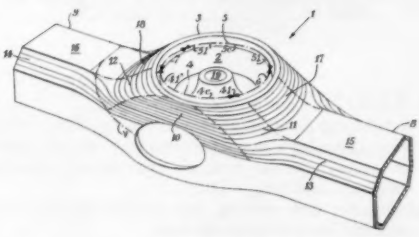
1. Apparatus for lagging textile yarn on wheeled buggies comprising:
- at least one storage lane for textile yarn buggies, the storage lane having an inlet and an exit;
- a plurality of wheeled textile yarn buggies having connecting means for joining the buggies together as a train in the storage lane;
- means located at the exit from the storage lane for detecting the presence of a buggy; and
- means located in the storage lane and adjacent to the detector means for moving the train of buggies forward at least one buggy length and for displacing the connecting means of the buggy nearest the exit so as to disconnect it from the remainder of the train, said means for moving being actuated by the buggy detecting means each time the buggy detecting means fails to detect the presence of a buggy.



4,144,819
TRUCK BOLSTER

Jean-Claude Guillaumin, L'Etang la Ville, France, assignor to Societe des Acieries de Paris et D'Outreau, Paris, France

Filed Mar. 17, 1977, Ser. No. 778,606
Claims priority, application France, Mar. 19, 1976, 76 08130
Int. Cl.[2] B61F *1/12, 5/04, 5/16, 5/50*
U.S. Cl. 105—230 **4 Claims**



1. A truck cross member for railway vehicle, comprising:
- a pair of longitudinal horizontal upper wall portions,
- a longitudinal horizontal lower wall,
- two longitudinal vertical walls,
- said longitudinal horizontal lower wall being connected to each longitudinal vertical wall
- first and second pairs of longitudinal inclined wall portions, each pair of inclined wall portions connecting said pair of longitudinal horizontal upper wall portions to one of said two longitudinal vertical walls, and
- a center bearing composed of a bowl having a central pintle receiving hole and a circular peripheral lip, said center bearing being disposed between said two longitudinal horizontal wall portions, said lip being, in each one of two first areas thereof, tangential to an upper edge of a corresponding one of said two longitudinal vertical walls, said lip being, in each one of two second areas thereof, smoothly connected to a corresponding one of said two longitudinal horizontal wall portions through one of two connecting surfaces, and said lip being further, in each one of four third areas thereof, smoothly connected to said first and second pairs of longitudinal inclined wall portions via corresponding first and second pairs of sloping surfaces, each sloping surface sloping downwardly from a corresponding one of said four third areas of said lip, each delimited between two adjacent first and second areas, and each sloping surface having a lower portion which is

in skewed relationship to said corresponding third area, whereby the said lower portion of said sloping surface merges with one of said longitudinal inclined wall portions.

4,144,820

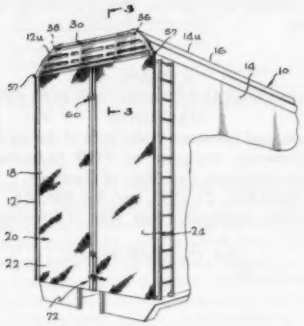
RAIL CAR CLOSURE

William M. Jaekle, Morago; Robert Byrne, San Carlos, and Armand Giovanelli, San Francisco, all of Calif., assignors to Southern Pacific Transportation Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 737,543, Nov. 1, 1976, Pat. No. 4,116,135. This application Jun. 27, 1977, Ser. No. 810,422

Int. Cl.[2] B61D *19/00, 3/02, 17/06*

U.S. Cl. 105—368 R **4 Claims**



1. In a rail car which includes a closed roof, sides that slope towards each other at their upper ends, and tall ends, the improvement comprising:

a gate structure closeable over most of one end of said rail car, and openable away therefrom, said gate structure sidewardly moveable and storeable at at least one side of the car below the slope in the car side;

a top door having sides sloping to conform to the sloped upper ends of said car sides;

holding means for supporting said door over the upper part of said car end, said door being moveable onto said roof by first tipping the lower end thereof outwardly and up and then sliding it along said holding means onto said roof;

said gate structure including a portion moveable to a position directly outside a lower portion of said door, to prevent outward tipping of said door when said gate structure lies over said rail car end.

4,144,821

AIRCRAFT CARGO PALLET RESTRAINT

Robert D. Lang, 633 Lido Park Dr., B-1, Newport Beach, Calif. 92663

Filed Apr. 13, 1977, Ser. No. 787,162

Int. Cl.[2] B60P *7/08;* **B61D** *45/00;* **B64C** *1/20;* **B65J** *1/22*

U.S. Cl. 105—465 **10 Claims**

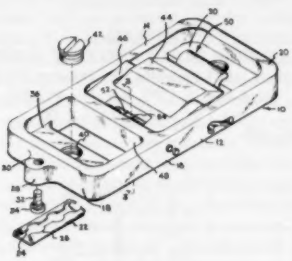
1. A folding cargo restraint which comprises:

a frame of longitudinal and end cross members;

a pawl plate member;

aft leg means and fore leg means, each means pivotally mounted within said frame between said longitudinal members and pivotally attached to said pawl plate member and in parallel alignment to each other to permit retraction of said pawl plate member and aft and fore leg means as a folding parallelogram into a folded position within said frame, and raising of said pawl plate member and leg means into an erected cargo restraining position, elevated above said frame; and

a transverse rib member spaning between said longitudinal members immediately forward of said fore leg means to provide an abutment to restrain forward movement of said



leg means when said pawl plate member is in its erected position.

4,144,822

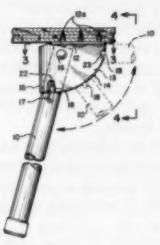
FOLDING LEG MECHANISM

Kent S. Roberts, and Brent J. Roberts, both of American Fork, Utah, assignors to Roberts Mfg., Inc., American Fork, Utah

Filed Jan. 24, 1977, Ser. No. 761,617

Int. Cl.[2] A47B *3/00*

U.S. Cl. 108—129 **9 Claims**



1. A folding leg mechanism for a table, comprising an elongate leg; means for pivotally attaching the leg to the underside of a table for swinging movement between a downwardly disposed, extended position and a folded, retracted position in which the leg lies substantially adjacent to the underside of the table; longitudinal slot means in the leg, said slot means extending at least through one side of the leg and being in substantially longitudinal alignment along the leg with the pivot axis about which the leg swings; a pin extending outwardly through said slot means for movement longitudinally therealong; spring means associated with said pin so as to apply a continuous force on the pin in a direction toward the end of said leg which is pivotally attached to said table; a trackway positioned at the side of the leg from which said pin extends, so that the pin rides on and along the trackway as the leg swings between its retracted and its extended positions; abutment means with which a lateral side of said leg makes contact when it is moved to its extended position, said abutment means being positioned so that said leg must move beyond a position in which its longitudinal axis is normal to the table top when being extended and will engage a lateral side of said leg after said leg has swung at least slightly beyond the point at which it is normal to the underside of the table; and upwardly extending, pin-receiving recess means in said trackway positioned so that said pin will enter the recess means under the force of said spring means as the leg makes contact with the abutment means, the longitudinal centerline of said recess means being substantially normal to the table, whereby when the pin enters the recess means, a wedging action is produced between the pin, a side of the recess means that confronts said abutment, and a side of said slot means that confronts said side of the

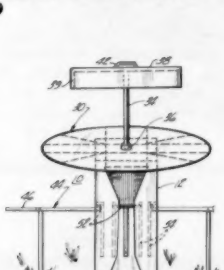
recess means, which action urges the leg against said abutment means and locks it in position against any further movement about its pivotal connection to the table.

4,144,823

COLLAPSIBLE TABLE AND SEAT ASSEMBLY

Larry F. Rathert, 1527 Franklin Dr., Inkster, Mich. 48141

Filed Jun. 2, 1977, Ser. No. 802,881
Int. Cl.[2] A47B *39/00, 3/00*
U.S. Cl. 297—159 **9 Claims**



1. An apparatus comprising:

a housing having a hollow interior;

tabletop means foldable between an open and closed position, whereby in said closed position, said tabletop means is adapted to be contained within the interior of said housing and whereby in said open position said tabletop means is supported in an elevated and substantially horizontal position by said housing;

seat means secured to said housing and selectively extendable therefrom wherein said seat means comprises at least one seat pivotally secured at one end to said housing and movable between a retracted position and an extended position; and

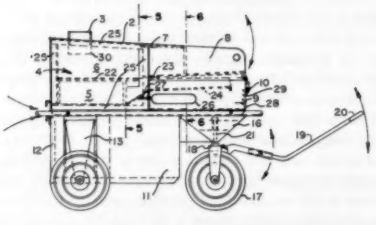
means for automatically locking each seat in its retracted position upon the insertion of said tabletop means within the interior of said housing.

4,144,824

INCINERATING AND ENERGY CONVERTING APPARATUS

Leonard C. Bartling, Sr., 476 S. Park Ave., Webster Groves, Mo. 63119

Filed Dec. 2, 1977, Ser. No. 856,651
Int. Cl.[2] F23G *5/12*
U.S. Cl. 110—214 **19 Claims**



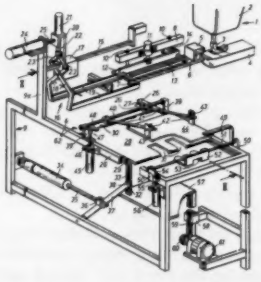
3. An apparatus for fully burning of waste combustible materials with reduced dissemination of pollutant fumes comprising a housing, said housing incorporating a firebox, said firebox being segregated into two chambers, one of said chambers being a primary combustion chamber, the other of said chambers being an upper disposed secondary combustion chamber, a grate member separating said chambers, said secondary combustion chamber being structurally arranged directly above the primary combustion chamber, said combustion chambers being lined with insulation, a flue connecting to and providing for gas discharge from said chambers, said flue extending downwardly some distance into the secondary combustion chamber, access means providing entrance into both said chambers for deposition of waste combustible material therein, wherein upon ignition of said combustibles arranged in the said chambers, the burning in the secondary chamber acts to provide a complete forced combustion of any hydrocarbonacous materials entrained within the egressing flue gases, a feed chute associated with each of the access means into the combustion chambers, said feed chutes extending forwardly of the said housing, and said feed chutes being disposed for facilitating the deposition of waste materials into each of the primary and secondary combustion chambers during operation of the apparatus.

4,144,825

WORKPIECE STACKING DEVICE FOR SEWING MACHINES

Werner Angele, and Hermann Welz, both of Au am Rhein, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Kaiserslautern, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 845,941
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649471
Int. Cl.[2] D05B *41/00*
U.S. Cl. 112—121.29 **6 Claims**



1. A device for the removal of flexible workpieces which are draped over a workpiece holding arm and hang downwardly from each side thereof, in particular, over a work-handling arm of an arm-down sewing machine, comprising a carrying arm adapted to receive the sewn material and support it so that portions hang downwardly from each side of said carrying arm, a material-engagement clip having a pair of clamping arms located below said carrying arm, means mounting said clip for movement in directions substantially parallel to said carrying arm to move said clamp arms on respective sides of the workpiece, clamp arm actuating means connected to said clamp arms to close said clamp arms for engaging the workpiece from the respective opposite sides below said carrying arm to move with said clip to withdraw the workpiece from said carrying arm and also to open said clamping arms to release the workpiece, a workpiece receiving plate disposed below said carrying arms, means mounting said receiving plate for movement to a position below said clip when said clamping arms are withdrawn from said carrying arm to engage the workpiece sides and to deflect it onto said receiving plate into a horizontal position and for movement of said receiving plate away from said clip with the workpiece, and clamp means engageable with the workpiece on said receiving plate to remove it from said receiving plate and deposit it into a vertical stack.

4,144,826
SEWING MACHINE FOR MAKING DECORATIVE STITCH PATTERNS

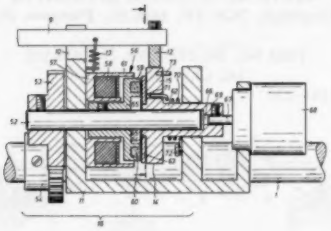
Bernhard Stehlin, and Joachim Wilken, both of Ettlingen, Fed. Rep. of Germany, assignors to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 842,341

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647763

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 E **10 Claims**



1. In a sewing machine for making successive stitches of decorative stitch patterns, including a main shaft, a sewing needle, a fabric feed, at least one setting member, for adjusting one of the overstitch width and the stitch length, an actuating means adjusting each setting member responsive to control signals from a program control system, the improvement comprising, in combination, a drive continuously operated during rotation of said main shaft; clutch means including a first clutch disk connected to said setting member to rotate therewith and a second clutch disk connected to said drive for rotation thereby; and reset means operatively associated with each setting member and acting to rotate the associated setting member in a direction opposite to the direction of rotation of said drive.

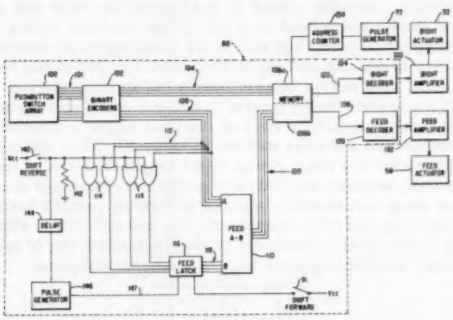
4,144,827
EXPANDED ENTRY FOR PROGRAMMABLE MEMORY OF A SEWING MACHINE

Jack Brown, Union, N.J., assignor to The Singer Company, New York, N.Y.

Filed Apr. 25, 1978, Ser. No. 900,027

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 E **5 Claims**



1. A programming device for a sewing machine having stitch forming means including a sewing needle and feeding system, said stitch forming means being operative to form successive stitches and including mechanisms for influencing stitch position coordinates of said successive stitches in the formation of a pattern of stitches, said sewing machine further including logic means responsive to input data representative of stitch position coordinates for producing stitch position coordinate electrical signals, actuating means responsive to signals from said logic means for controlling the position of said stitch forming means in accordance with input data fed to said logic means, said programming device being operably connected with said sewing machine and including memory means operative for storing digital input data corresponding to a stitch pattern selected by the operator and for transmitting electrical digital output signals to said logic means such that an operator may select a stitch pattern program for entry into the sewing machine for automatic reproduction of the stitch pattern by the sewing machine, said programming device further including a plurality of operator manipulating means each for generating stitch position coordinate information, said operator manipulating means being arranged in an array of columns and rows related, respectively, to selected lateral position of needle penetration and to selected feed increment from a just prior stitch position coordinate for feed, each row of said array of said operator manipulating means being assigned a digital coded character as a stitch position coordinate for feed and manipulation of any of said operator manipulating means in a given row will generate a specific stitch position coordinate for feed, said programming device including a feed data latch for preserving a current stitch position coordinate for feed for subsequent use as a just prior stitch position coordinate for feed and a feed subtractor to obtain the feed increment of the current stitch position coordinate for feed over the just prior stitch position coordinate for feed, wherein the improvement comprises; means for originating an artificial signal representative of a new starting point, and means for inserting said artificial signal in said feed subtractor in place of said just prior stitch position coordinate for feed.

4,144,828
SEWING MACHINE WITH A FEED DEVICE

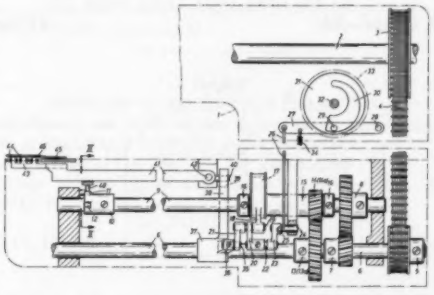
Günter Meier, Karlsruhe, Fed. Rep. of Germany, assignor to Dorina Nahmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 7, 1977, Ser. No. 831,145

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640174

Int. Cl.² D05B *27/00*

U.S. Cl. 112—210 **8 Claims**



1. In a sewing machine having a housing, a needle which is reciprocated on said housing at a sewing station zone into and out of engagement with a workpiece, a main machine shaft connected to said needle through a continuous drive connection to reciprocate said needle, the inmprovement comprising feed means connected to the main machine shaft for feeding the workpiece past the needle at the sewing zone, transmission means provided between said feed means and the main machine shaft to cause said feed means to perform a plurality of feed steps while the needle is out of engagement with the workpiece.

4,144,829

METHOD AND APPARATUS FOR VENTING HYDROCARBON GASES FROM THE CARGO COMPARTMENTS OF A TANKER VESSEL

Charles S. Conway, Featherbed La., New Vernon, N.J. 07976

Filed Sep. 1, 1977, Ser. No. 829,775
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 R **10 Claims**

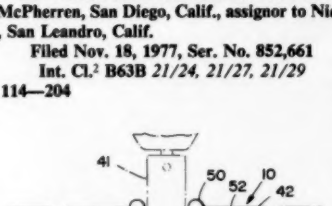
1. In a tanker vessel for the transportation of oil in water, said vessel including a hull comprising a bottom and sides, a top deck, a plurality of watertight cargo compartments disposed within the hull between said top deck and said hull bottom for receiving said oil, and vent means including cargo expansion trunk means coupled to and opening downwardly into each of said cargo compartments and vent closure valve means coupled to said cargo expansion trunk means and communicative externally of said compartments for venting hydrocarbon gases from said cargo compartments through said cargo expansion trunk means to the atmosphere, the improvement comprising valve means including pipe means coupled to and communicative with at least two of said cargo compartments and opening into said compartments at the top of said compartments, said pipe means comprising first pipe means coupled to one of said cargo compartments and second pipe means coupled to the other of said cargo compartments, said valve means directly interconnecting said first and second pipe means for venting hydrocarbon gases from one of said two cargo compartments to the other of said cargo compartments through said first and second pipe means after discharge of oil from said one of said compartments.

4,144,830

LOW FRICTION TRACK TRAVELER

Glen E. McPherren, San Diego, Calif., assignor to Nicro Corporation, San Leandro, Calif.

Filed Nov. 18, 1977, Ser. No. 852,661
Int. Cl.[2] B63B *21/24, 21/27, 21/29*
U.S. Cl. 114—204 **6 Claims**



1. A traveler car adapted for movement along a track having an I-beam-shaped cross-section with a central vertical web and integral upper and lower horizontal flanges, said traveler comprising:

a main body section with retainer means for holding the end of a line in tension;

a pair of spaced apart lower body portions attached to and extending downwardly from said main body section so as to be positioned on opposite sides of said track;

means forming a continuous race on the inside surface of each said lower body portion, said two races being in generally parallel, vertical planes on either side of said central vertical web and each including a straight upper reach and a straight lower reach;

a plurality of recirculating balls filling each said race, said balls of each race being exposed to the track along both the upper and lower reaches;

whereby for every direction of tension force applied to said retainer means at least some of said recirculating balls of said lower body portions are constantly in contact with surfaces on said track.

4,144,831

NAUTICAL MOORING APPARATUS

Fred R. Heydolph, 2634 SE. 14th St., Pompano Beach, Fla. 33062

Filed Sep. 30, 1977, Ser. No. 838,102
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—230 **5 Claims**

1. A nautical mooring apparatus comprising a rigid open-ended tubular member having a first end and a second end, said tubular member forming a longitudinal open-ended chamber therein, a piston assembly including a piston and a rod portion fixedly secured thereto, said piston slideable within said longitudinal chamber, said rod portion coaxially extensible out of said longitudinal chamber through an opening located in said second end of said tubular member, first means for urging said piston toward said second end of said tubular member, second means for urging said piston toward said first end of said tubular member, first means for affixing said first end of said tubular member to a supporting surface, said first affixing means including a first rod rotatably affixed on a first end thereof to a first bracket, said first bracket for affixment to said supporting surface, the second end of said first rod providing a ball-shaped element, and a first cap fixedly secured to said tubular member adjacent said first end thereof, said first cap providing a capturing chamber therein, said capturing chamber capturing said ball-shaped element and permitting angular movement of said second end of said first rod relative to said supporting surface, and second means for affixing said rod portion of said piston assembly to a nautical vehicle, said second affixing means including a second bracket for affixment on one end thereof to said nautical vehicle, a second rod, one end of said second rod pivotally removably affixed to said bracket the other end of said second rod affixed to a ball, a cap, said cap having a hemispherical cavity and said cavity extending to an external surface of said cap, said cap secured to the free end of said rod portion, said second bracket having an aperture therein, a plate, said plate fixedly secured to said one end of said second rod, said plate having circular marginal edges, a sheet-like member, said sheet-like member slideably affixed to said second bracket at a plane normal to the longitudinal axis of said aperture, whereby said plate is rotatably locked into said aperture when said sheet-like member is disposed partially juxtaposed with said plate, wherein said first and said second affixing means permits movement of the longitudinal axis of said tubular member angularly relative to a horizontal plane.

4,144,832

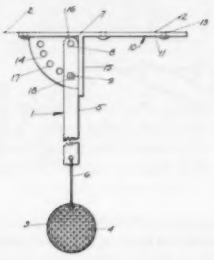
BIRD SPOOK

Forrest N. Dahl, 912 W. Summit Ave., Fergus Falls, Minn. 56537

Filed Dec. 29, 1977, Ser. No. 865,617
Int. Cl.[2] A01M *29/00*
U.S. Cl. 116—22 A **5 Claims**

1. A bird spook for frightening unwanted birds and other pests from a surface of a building or the like comprising a thin

disc-like plate having at least one light reflecting surface, an elongated arm having a support mounting end, a swivel connection attaching said plate to said arm for allowing motion of said plate in any direction, and an adjustable support securing said arm to said building surface and operable to incline said arm at a predetermined angle with respect to said building surface, said support comprising a planar foot plate adapted to be mounted to a planar mounting surface a of said building surface, fin-like arm-supporting flange attached perpendicularly to the surface of said foot plate opposite said planar mounting surface of said building surface, said flange containing a pivot point and a plurality of spaced apertures arranged



radially equidistant from said pivot point along one edge of said flange, the support mounting end of said arm being pivotally mounted to said pivot point and containing an aperture spaced from said pivot point such that said arm aperture and anyone of said plurality of apertures are substantially coaxial at predetermined angular positions of said arm said arm being limited in motion by a rib normal to said planar foot plate, and locking means communicating with said coaxial apertures to prevent angular movement of said arm, whereby said bird spook may be mounted on any type of building surface and said plate may be caused to oscillate by air movements to cause random light reflections from said reflecting surface.

4,144,833

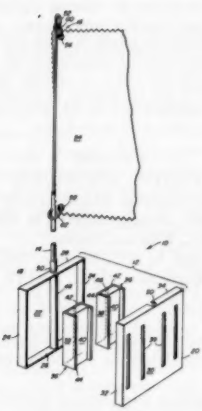
EMERGENCY DISTRESS SIGNAL

Edward G. Newman, Sr., 31 Cherry Ridge Rd., P.O. Box 381, Hewitt, N.J. 07421

Filed Dec. 19, 1977, Ser. No. 862,084

Int. Cl.[2] B60Q *1/52*

U.S. Cl. 116—28 PR **1 Claim**



1. An emergency distress signal device comprising in combination:

a base assembly having front and rear panels and top, bottom and side panels to form a substantially rectangular housing;

a plurality of rectangular, vertically oriented slots cut away from said rear panel;

a plurality of generally U-shaped magnetic assemblies positioned within said base assembly having two L-shaped angles, a magnet disposed between said angles, and the vertical legs of said angles being positioned through said slots in said rear panel;

a telescoping mast whose base is secured within said base assembly, and protruding only through the top thereof and having a semicircular loop at its peak;

a distress signal flag of flexible fabric or plastic material having grommets on its upper and lower corners along its vertical edge;

a first loop connecting said upper grommet to said semi-circular loop;

a second loop passing through said lower grommet and around said mast assembly.

4,144,834

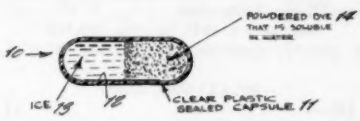
DEFROST INDICATOR

James Donegan, 2455 Washington Ave., Bronx, N.Y. 10458

Filed Dec. 27, 1976, Ser. No. 754,847

Int. Cl.[2] G01K *11/06*

U.S. Cl. 116—219 **2 Claims**



1. A defrost indicator for visable installation in a package of frozen food comprising in combination, a capsule formed of transparent material and comprising a single, sealed compartment inside said capsule, said capsule containing in unmixed condition a quantity of colorless frozen ice conforming in shape to a portion of said compartment, and a quantity of powdered dye of a specified color in the other portion of said compartment, said dye being soluble in liquid from which said ice is formed and capable of discoloring said frozen ice into said specified color upon melting of said ice and when a defrost condition is reached, and wherein said single, sealed compartment contains both said frozen ice and said dye at opposite end portions of said compartment.

4,144,835

CONTACT HEAT FIXING APPARATUS

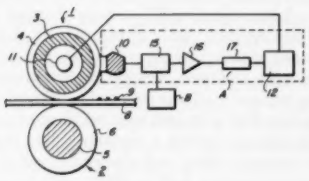
Yasuji Fukase, and Hiroo Nishide, both of Ebina, Japan, assignors to Rank Xerox Limited, London, England

Filed Oct. 25, 1977, Ser. No. 844,849

Claims priority, application Japan, Nov. 5, 1976, 51-148031[U]

Int. Cl.[2] H05B *1/02*

U.S. Cl. 118—5 **9 Claims**



1. Fuser apparatus for fixing toner images on substrate material, said apparatus comprising:

first and second roll members;

a heating element disposed internally in one of said members and a source of energy therefor;

means for controlling the surface temperature of said roll first during a standby mode followed by a fusing mode and then a standby mode again;

said control means for controlling said surface temperature during a standby mode controlling it at a first temperature level and during said fusing mode at a second temperature level which is lower than said first temperature level;

means for delaying control at said second temperature after termination of said standby mode and for delaying control at said first temperature after termination of said fusing mode.

4,144,836

APPARATUS FOR THE VACUUM IMPREGNATION OF BOARDS OR PANELS OF POROUS MATERIAL

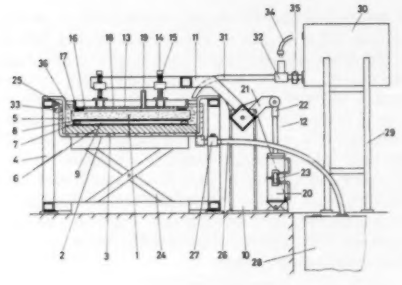
Oskar Bernath, Umiken, Switzerland, assignor to Georg Fischer AG Brugg, Brugg, Switzerland

Filed May 3, 1977, Ser. No. 793,314

Claims priority, application Switzerland, May 6, 1976, 5669/76

Int. Cl.² B05C *3/20*

U.S. Cl. 118—7 **11 Claims**



1. Apparatus for vacuum impregnation of panels consisting essentially of porous material and formed with a pair of generally planar opposed surfaces with edge portions extending thereabout to define the periphery of said panels, said apparatus comprising: means defining a bath of impregnating fluid; fixed support means receiving thereupon panels to be impregnated with said fluid; movable cover meanns removably positionable relative to said fixed support means to maintain a panel to be impregnated in a clamped position therebetween while maintaining said edge portions in an exposed condition; sealing means for defining an enclosed fluid tight chamber between at least one of said opposed planar surfaces of said clamped panel and at least one of said fixed support means and said movable cover means when said panel is in said clamped position; means for effecting immersion of said clamped panel within said bath of impregnating fluid with said edge portions exposed to said fluid; and means for creating a vacuum within said enclosed fluid tight chamber while said clamped panel is immersed within said impregnating fluid to effect aspiration of said impregnating fluid into said clamped panel through said edge portions by the action of the suction effect created within said enclosed fluid chamber by said vaccum means.

4,144,837

COATING APPARATUS

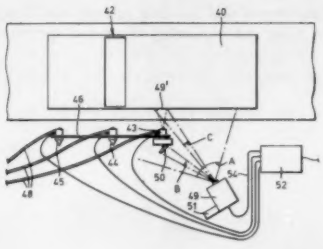
Edward Johnston, Chertsey, England, assignor to Carrier Drysys Limited, London, England

Filed Oct. 5, 1977, Ser. No. 839,536

Claims priority, application United Kingdom, Oct. 5, 1976, 41359/76

Int. Cl.² B05B *12/02*

U.S. Cl. 118—7 **6 Claims**



1. Coating apparatus for coating an article moving relative to a coating station, which apparatus comprises a coating applicator located at the coating station, a reciprocator for moving the applicator in strokes transverse to the direction of relative movement, a television camera or other opto-electrical transducer arranged to view at least part of the article and the applicator, the field of view being such as to cover the full area of each coating stroke, and control means responsive to an output signal from the camera or transducer and operable to control the operation of the applicator to apply coating material only when the applicator is located adjacent part of the article to be coated, which control means comprises first control means for identifying the position in the vertical field of view of the camera or transducer to which video signals from the camera or transducer correspond, second control means for identifying a first window in the horizontal field of view of the camera or transducer corresponding to the path of the applicator and a second spaced window in the horizontal field of view corresponding to an area which may be coated by the applicator, third control means for determining whether the signal in the first window corresponds to the presence of the applicator as the television camera or transducer effects a vertical scan, and fourth control means for determining whether the signal in the second window corresponds to part of the article to be coated as the camera or transducer effects a vertical scan, store means for storing signals from said first control means and said fourth control means, and fifth control means arranged to read information from the store means and provide an operating signal for controlling the applicator when the first control means and third control means provide signals indicating that the applicator is in an operating position.

4,144,838

COATING APPARATUS

Takashi Ichiyanagi; Takashige Akiyama, both of Hirakata, and Ichizo Otoda, Ikeda, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 5, 1977, Ser. No. 784,773

Claims priority, application Japan, Apr. 15, 1976, 51-43123

Int. Cl.² B05C *3/12*

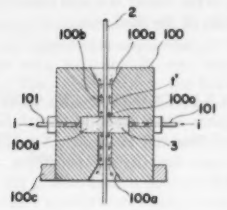
U.S. Cl. 118—125 **3 Claims**

1. A coating apparatus for applying a coating solution on to a material to be coated passing therethrough, said apparatus comprising:

a container containing said coating solution therein;

floating die member means within said container and having an opening therethrough for allowing said material to be coated to pass therethrough after it passes through said coating solution; and

radial bearing member means in a position in said container prior to said floating die member means with respect to the direction of movement of said material to be coated, said bearing member means having a through hole



through which said material to be coated passes said radial bearing member means being comprised of a static pressure type forced lubricating bearing that maintains the material coaxial of the said though hole.

4,144,839

FEEDING DEVICE FOR SUPPLYING DEVELOPER POWDER TO A MAGNETIC DRUM

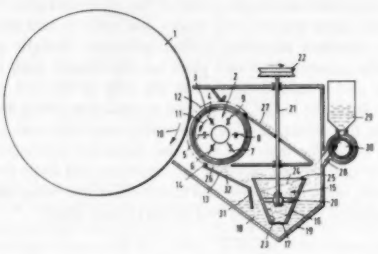
Werner Salger, Hamburg-Langenhorn, Fed. Rep. of Germany, assignor to Fa. Lumoprint Zindler KG (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,670

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2643032

Int. Cl.[2] G03G *15/09*

U.S. Cl. 118—658 **15 Claims**



1. A developing apparatus for developing a particularly electrostatically generated latent image on a drum-type carrier, the apparatus including a generally horizontally arranged magnet drum extending parallel to the drum-type carrier and adapted to generate a developer powder brush, the magnet drum having a first surface being spaced from the drum carrier so that the developer powder brush generated at the magnet drum moves past the drum-type carrier in contact therewith whereby the tips of the brush move relative to the drum carrier and a diametrically opposed second surface, said magnet drum having a lower surface located between the first and second surfaces, a casing having an opening therein toward the drum-type carrier, the magnet drum being rotatably mounted within said casing in the vicinity of the opening therein, the casing adapted to receive a supply of developer powder spaced downwardly from the magnet drum; at least one pumping means mounted within said casing below and on the side of said magnet drum adjacent to the second surface thereof and having a lower inlet end dipping into said supply of developer powder and an upper outlet end, wherein the improvement comprises a baffle sheet located within said housing below said magnet drum, said baffle sheet having an upper end located adjacent the lower surface of said magnet drum, at least a portion of the surface of said baffle sheet extending downwardly from the upper end thereof and inclined to the vertical toward the outlet end of said pumping means, said at least one pumping means arranged to direct developer powder from the outlet end thereof onto said at least a portion of said baffle sheet so that the developer powder reaches the lower surface of said magnet drum by sliding upwardly over said at least a portion of said baffle sheet; and first drive means for driving said magnet drum and second drive means for driving said pumping means.

4,144,840

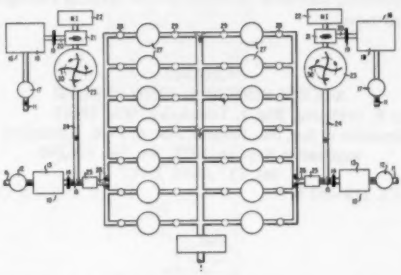
RAISING PELAGIC GAME FISH

James K. Bubien, R.F.D. No. 3, Box 215, Dunn's Corner, Westerly, R.I. 02891

Filed Apr. 8, 1977, Ser. No. 786,016

Int. Cl.[2] A01K *61/00*

U.S. Cl. 119—3 **15 Claims**



1. A biologically closed, physically open process for raising pelagic game fish which comprises:

(1) providing a supply of larval fish;

(2) maintaining the larval fish in a container in a biologically closed, physically open system;

(3) growing a supply of food within the system by mixing nutrients and plankton in sterilized, filtered sea water to form a culture medium;

(4) providing a substantially homogeneous, continuous supply of food to the larval fish by an upflow of the culture medium in the container;

(5) continuously removing toxic waste from the system; and

(6) maintaining the larval fish in the system for a period of time sufficient to permit the larval fish to develop into viable juvenile fish.

4,144,841

AERATION AND FILTRATION APPARATUS

George D. Bliss; Joseph E. Kereso, both of Palo Alto, and Richard J. McGuire, Fremont, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 613,372, Sep. 15, 1975, abandoned. This application Dec. 22, 1976, Ser. No. 753,021

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—5 **13 Claims**

1. A filtration and aeration apparatus which comprises

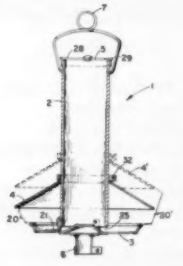
a. an elongated tubular member which is closed at its lower end, open at the opposite end, and provided solely at its lower portion with a plurality of passages which extend through the longitudinal wall of the tubular member and

b. an air delivery means for supplying air to the interior of said tubular member at a level at or slightly below the lowermost of said passages so that the air is discharged in the interior of said tubular member parallel to the length of said tubular member and in an upward direction, wherein said air delivery means comprises (i) an air tube connected to and extending into (ii) a chamber designed to allow air to escape from said chamber through passages in

the chamber wall so that the air is discharged through said chamber wall passages in a direction opposite from the

direction said air is delivered to said chamber through said air tube.

4,144,842
ACCESS LIMITING BIRD FEEDER
Anton E. Schlising, Rte. 1, Tomahawk, Wis. 54487
Continuation of Ser. No. 700,055, Jun. 6, 1976, abandoned. This application Sep. 16, 1977, Ser. No. 834,048
Int. Cl.[2] A01K *39/01*
U.S. Cl. 119—52 R **3 Claims**



1. A marauder protection providing access limiting small bird feeder comprising; in combination,

(a) a first means and second means for enabling the supporting of the feeder several feet above the ground,

(b) a cylindrical feed column of hard transparent material such as glass, acrylic plastic, and the like and having a top and a bottom,

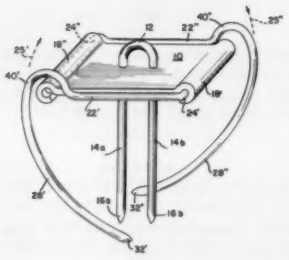
(c) a removable cap having a smooth top and the cap fitting closely to the top of the feed column in such a way as to deny a marauder a grip upon the cap or the top of the cylinder,

(d) a circular feed pan positioned at and attached to the bottom of the feed column by means of brackets which maintain a gap between the feed column and the pan and the feed pan having a rim at its outer edge and a feed receiving area in the vicinity of the feed column and the diameter of the feed pan is greater than twice the diameter of the feed column,

(e) a movable metal hood in the shape of a truncated cone positioned over the feed pan and the movable hood is clampably secured to the cylindrical feed column and the major diameter of the hood is greater than the diameter of the feed pan and the movable hood is positioned along the feed column with the major diameter down so as to overhang the rim of the feed pan to define a gap between the hood and the feed pan and thereby limit the maximum size of a bird which may pass between the hood and the feed pan and gain access to the feed in the vicinity of the feed column and the hood and the feed column combined provide a non-grippable expanse which is greater than the reaching length of most small animal marauders, and

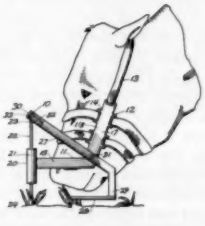
(f) the first means for enabling the supporting of the feeder is a wire bail hanging means secured to the top of the cylindrical feed column and the second means for enabling the supporting of the feeder is a post mounting means secured to the bottom of the feed pan.

4,144,843
SELF-LOCKING ANCHOR STAKE
Benton Schrougham, 243 S. 25th St., Beech Groove, Ind. 46107
Filed Nov. 19, 1975, Ser. No. 633,450
Int. Cl.[2] A01K *3/00*
U.S. Cl. 119—121 **2 Claims**



1. A self-locking anchor stake comprising a generally horizontally extending plate including tethering means extending upwardly therefrom and second, third and fourth members for inserting into the earth, said second member being rigidly attached to said plate and defining a downwardly extending plane perpendicular to the plane of the plate, said plate having two side edges and two end edges, and each of said third and fourth members including a first generally straight portion hingedly connected to said plate for movement with respect thereto and a second portion at the end of the first portion remote from the hinge, the second portion describing an arc of a circle, the center of which generally coincides with the axis of the hinge for insertion into the earth for intersecting the plane of said second member for retaining said stake firmly in the earth, one of said third and fourth members being hingedly connected at each of said end edges of said plate.

4,144,844
GRAZING REGULATOR
William H. Crumpacker, 1538 School Ave., Walla Walla, Wash. 99362
Filed Dec. 12, 1977, Ser. No. 859,690
Int. Cl.[2] A01K *25/00*
U.S. Cl. 119—133 **3 Claims**



1. A grazing regulator mountable on the head of an animal, comprising:

a rigid frame;

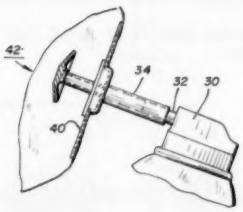
mounting means on the frame for securing the frame to the muzzle of an animal adjacent to its mouth;
an actuator rod having an upper end and a lower end;
upright guide means on said frame slidably mounting the actuator rod to the frame for up and down sliding movement in relation thereto;
a grazing plate;
a rocker arm having a lower end affixed to the grazing plate and an upper end operatively connected to the upper end of the actuator rod, said rocker arm being pivotably mounted to the frame intermediate the lower and upper rocker arm ends for movement about a transverse axis on the frame;
wherein the grazing plate is movable about said axis between an inoperative position clear of the animal's mouth to allow it to eat tall grasses and an operative position overlapping the animal's mouth to prevent it from eating short grasses; and
said lower end of the actuator rod projecting beneath the grazing plate when the plate is in the inoperative position to permit it to engage the ground and slide upward within the guide means to pivot the grazing plate to the operative position as the head of the animal is lowered to a predetermined elevation above the ground.

4,144,845

BAG FOR PETS WITH ACCESS OPENINGS THEREIN FOR APPLYING FLEA KILLING SPRAY

Vincent R. Sneider, 3422 Hallcrest Dr., N.E., Atlanta, Ga. 30319

Filed Jun. 7, 1977, Ser. No. 804,344
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—160 **6 Claims**



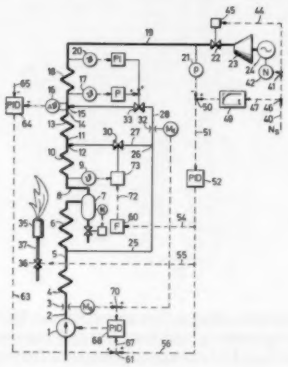
1. A flexible bag for pets and providing a temporary encasement of the pet therein in a substantially closed condition and providing for the introduction of a spray killing material, the bag including: (a) at least one piece of impervious sheet material cut to a selected contour and providing therewith a bag when seamed together at appropriate joining areas; (b) a collar portion provided with a draw closure means by which the collar of the bag is drawn tightly to and around the neck of the pet while the head of the pet is outside the bag and is open to the atmosphere; (c) a slide fastener-type closure mounted along a longitudinal extent of the bag, this slide fastener and the collar portion closure when open permitting the placing in and taking out of the pet from the bag and when closed this slide fastener closure substantially seals this opening against the unwanted escape of spray when introduced into the bag; (d) leg portions formed in the bag and having means for closing the end portions of each leg portion to prevent a leak of spray from the end portions while providing means for a spray to pass from the body portion to and down each leg portion; (e) a plurality of tubular spray conduits each mounted in a selected portion of the bag material, each conduit having its outer end adapted to receive and tightly engage a nozzle of a spray container of insect killer and with the inner end of the conduit disposed within the bag and having a closure disc mounted in the end of the conduit and spaced a short distance in from the bag wall, this disc in addition to closing the end of said conduit to the passage of any spray also is so formed as to provide a deflector which in combination with the tubular conduit has a plurality of outlet passageways which are so directed that a spray passage through the conduit from the outer inlet is deflected from its inward path and into the interior of the bag, the pressurized spray prevented by the deflector from a direct contact with the skin of the pet.

4,144,846

FORCED-FLOW STEAM GENERATOR

Pawel Miszak, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Sep. 27, 1977, Ser. No. 837,011
Int. Cl.[2] F22G *5/12;* **F22B** *29/06*
U.S. Cl. 122—479 R **13 Claims**



1. A forced-flow steam generator comprising
a feedwater supply means for delivering a flow of feedwater;
a plurality of heating surfaces including an economizer, an evaporator, a water separator and a superheater connected in series;
a first temperature measuring means in a first region of said superheater for sensing the temperature of a flow of working medium thereat and emitting an actual value signal in response thereto;
a second temperature measuring means at an end of said superheater and downstream of said first temperature measuring means relative to the flow of working medium for measuring the temperature of the working medium thereat;
at least one injection means between said first and second temperature measuring means for injecting water into the flow of working medium;
an injection line connected at one end to a point in the flow of feedwater between said economizer and said evaporator and at an opposite end to said injection means to deliver water thereto; and
a controller responsive to said actual value signal of said first temperature measuring means and a load-dependent signal as a set point signal for influencing the amount of water fed to said evaporator.

4,144,847

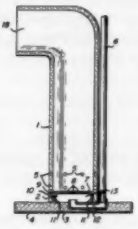
EMISSION CONTROL APPARATUS FOR INTERNAL ENGINES WITH MEANS FOR GENERATING STEP FUNCTION VOLTAGE COMPENSATING SIGNALS

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1976, Ser. No. 753,787
Claims priority, application Japan, Dec. 27, 1975, 50/155774
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EE **5 Claims**

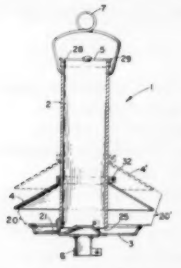
1. A closed loop mixture control system for an internal combustion engine having a throttle valve and means for supplying a mixture of air and fuel thereto in a variable ratio in

the chamber wall so that the air is discharged through said chamber wall passages in a direction opposite from the



direction said air is delivered to said chamber through said air tube.

4,144,842
ACCESS LIMITING BIRD FEEDER
Anton E. Schlising, Rte. 1, Tomahawk, Wis. 54487
Continuation of Ser. No. 700,055, Jun. 6, 1976, abandoned. This application Sep. 16, 1977, Ser. No. 834,048
Int. Cl.[2] A01K *39/01*
U.S. Cl. 119—52 R **3 Claims**



1. A marauder protection providing access limiting small bird feeder comprising; in combination,

(a) a first means and second means for enabling the supporting of the feeder several feet above the ground,

(b) a cylindrical feed column of hard transparent material such as glass, acrylic plastic, and the like and having a top and a bottom,

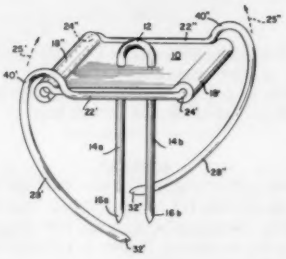
(c) a removable cap having a smooth top and the cap fitting closely to the top of the feed column in such a way as to deny a marauder a grip upon the cap or the top of the cylinder,

(d) a circular feed pan positioned at and attached to the bottom of the feed column by means of brackets which maintain a gap between the feed column and the pan and the feed pan having a rim at its outer edge and a feed receiving area in the vicinity of the feed column and the diameter of the feed pan is greater than twice the diameter of the feed column,

(e) a movable metal hood in the shape of a truncated cone positioned over the feed pan and the movable hood is clampably secured to the cylindrical feed column and the major diameter of the hood is greater than the diameter of the feed pan and the movable hood is positioned along the feed column with the major diameter down so as to overhang the rim of the feed pan to define a gap between the hood and the feed pan and thereby limit the maximum size of a bird which may pass between the hood and the feed pan and gain access to the feed in the vicinity of the feed column and the hood and the feed column combined provide a non-grippable expanse which is greater than the reaching length of most small animal marauders, and

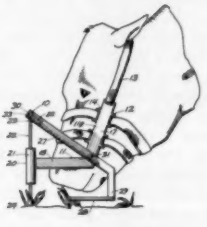
(f) the first means for enabling the supporting of the feeder is a wire bail hanging means secured to the top of the cylindrical feed column and the second means for enabling the supporting of the feeder is a post mounting means secured to the bottom of the feed pan.

4,144,843
SELF-LOCKING ANCHOR STAKE
Benton Schrougham, 243 S. 25th St., Beech Groove, Ind. 46107
Filed Nov. 19, 1975, Ser. No. 633,450
Int. Cl.[2] A01K *3/00*
U.S. Cl. 119—121 **2 Claims**



1. A self-locking anchor stake comprising a generally horizontally extending plate including tethering means extending upwardly therefrom and second, third and fourth members for inserting into the earth, said second member being rigidly attached to said plate and defining a downwardly extending plane perpendicular to the plane of the plate, said plate having two side edges and two end edges, and each of said third and fourth members including a first generally straight portion hingedly connected to said plate for movement with respect thereto and a second portion at the end of the first portion remote from the hinge, the second portion describing an arc of a circle, the center of which generally coincides with the axis of the hinge for insertion into the earth for intersecting the plane of said second member for retaining said stake firmly in the earth, one of said third and fourth members being hingedly connected at each of said end edges of said plate.

4,144,844
GRAZING REGULATOR
William H. Crumpacker, 1538 School Ave., Walla Walla, Wash. 99362
Filed Dec. 12, 1977, Ser. No. 859,690
Int. Cl.[2] A01K *25/00*
U.S. Cl. 119—133 **3 Claims**



1. A grazing regulator mountable on the head of an animal, comprising:

a rigid frame;

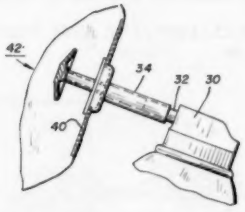
mounting means on the frame for securing the frame to the muzzle of an animal adjacent to its mouth;
an actuator rod having an upper end and a lower end;
upright guide means on said frame slidably mounting the actuator rod to the frame for up and down sliding movement in relation thereto;
a grazing plate;
a rocker arm having a lower end affixed to the grazing plate and an upper end operatively connected to the upper end of the actuator rod, said rocker arm being pivotably mounted to the frame intermediate the lower and upper rocker arm ends for movement about a transverse axis on the frame;
wherein the grazing plate is movable about said axis between an inoperative position clear of the animal's mouth to allow it to eat tall grasses and an operative position overlapping the animal's mouth to prevent it from eating short grasses; and
said lower end of the actuator rod projecting beneath the grazing plate when the plate is in the inoperative position to permit it to engage the ground and slide upward within the guide means to pivot the grazing plate to the operative position as the head of the animal is lowered to a predetermined elevation above the ground.

4,144,845

BAG FOR PETS WITH ACCESS OPENINGS THEREIN FOR APPLYING FLEA KILLING SPRAY

Vincent R. Sneider, 3422 Hallcrest Dr., N.E., Atlanta, Ga. 30319

Filed Jun. 7, 1977, Ser. No. 804,344
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—160 **6 Claims**



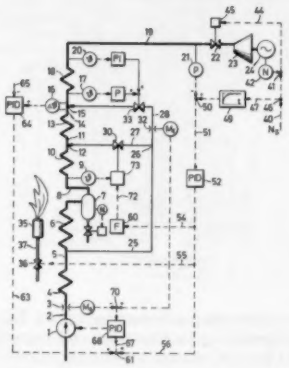
1. A flexible bag for pets and providing a temporary encasement of the pet therein in a substantially closed condition and providing for the introduction of a spray killing material, the bag including: (a) at least one piece of impervious sheet material cut to a selected contour and providing therewith a bag when seamed together at appropriate joining areas; (b) a collar portion provided with a draw closure means by which the collar of the bag is drawn tightly to and around the neck of the pet while the head of the pet is outside the bag and is open to the atmosphere; (c) a slide fastener-type closure mounted along a longitudinal extent of the bag, this slide fastener and the collar portion closure when open permitting the placing in and taking out of the pet from the bag and when closed this slide fastener closure substantially seals this opening against the unwanted escape of spray when introduced into the bag; (d) leg portions formed in the bag and having means for closing the end portions of each leg portion to prevent a leak of spray from the end portions while providing means for a spray to pass from the body portion to and down each leg portion; (e) a plurality of tubular spray conduits each mounted in a selected portion of the bag material, each conduit having its outer end adapted to receive and tightly engage a nozzle of a spray container of insect killer and with the inner end of the conduit disposed within the bag and having a closure disc mounted in the end of the conduit and spaced a short distance in from the bag wall, this disc in addition to closing the end of said conduit to the passage of any spray also is so formed as to provide a deflector which in combination with the tubular conduit has a plurality of outlet passageways which are so directed that a spray passage through the conduit from the outer inlet is deflected from its inward path and into the interior of the bag, the pressurized spray prevented by the deflector from a direct contact with the skin of the pet.

4,144,846

FORCED-FLOW STEAM GENERATOR

Pawel Miszak, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Sep. 27, 1977, Ser. No. 837,011
Int. Cl.[2] F22G *5/12*; F22B *29/06*
U.S. Cl. 122—479 R **13 Claims**



1. A forced-flow steam generator comprising
a feedwater supply means for delivering a flow of feedwater;
a plurality of heating surfaces including an economizer, an evaporator, a water separator and a superheater connected in series;
a first temperature measuring means in a first region of said superheater for sensing the temperature of a flow of working medium thereat and emitting an actual value signal in response thereto;
a second temperature measuring means at an end of said superheater and downstream of said first temperature measuring means relative to the flow of working medium for measuring the temperature of the working medium thereat;
at least one injection means between said first and second temperature measuring means for injecting water into the flow of working medium;
an injection line connected at one end to a point in the flow of feedwater between said economizer and said evaporator and at an opposite end to said injection means to deliver water thereto; and
a controller responsive to said actual value signal of said first temperature measuring means and a load-dependent signal as a set point signal for influencing the amount of water fed to said evaporator.

4,144,847

EMISSION CONTROL APPARATUS FOR INTERNAL ENGINES WITH MEANS FOR GENERATING STEP FUNCTION VOLTAGE COMPENSATING SIGNALS

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1976, Ser. No. 753,787
Claims priority, application Japan, Dec. 27, 1975, 50/155774
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EE **5 Claims**

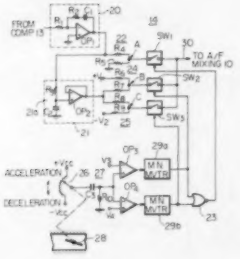
1. A closed loop mixture control system for an internal combustion engine having a throttle valve and means for supplying a mixture of air and fuel thereto in a variable ratio in

response to a control signal representative of the deviation of the air-fuel ratio within the exhaust system of the engine, wherein the system includes means for modifying the amplitude of the control signal to control the air-fuel ratio to a desired value, comprising:

means for sensing the rate of movement of said throttle valve and providing a first output signal corresponding thereto;

means for detecting the presence of acceleration and deceleration of said engine utilizing said first output signal and providing a second output signal wherever said rate of movement of said throttle valve exceeds a predetermined threshold level;

means for generating a signal representing a time integral of said modified control signal;



a source for providing a first and a second DC voltage;

means for combining said time integral representing signal with said first DC voltage to generate a first voltage signal and for combining said time integral representing signal with said second DC voltage to generate a second voltage signal; and

means for applying said first and second voltage signals to said air-fuel supply means in response to the detection of said acceleration or deceleration whereby a rich air-fuel mixture is supplied to said engine under acceleration and a lean air-fuel mixture is supplied to said engine under deceleration.

4,144,848

ORIENTATION OF TORCH OPENINGS FOR PRECHAMBER ENGINE

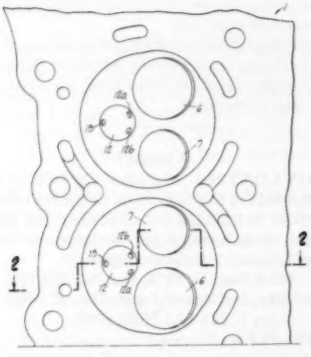
Toru Hatanaka, Urawa, and Yoshitoku Iizuka, Toda, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1977, Ser. No. 780,318

Claims priority, application Japan, Apr. 1, 1976, 51/35182

Int. Cl.[2] F02B *23/06*

U.S. Cl. 123—32 L **8 Claims**



1. In an internal combustion engine, the combination of: walls including a movable piston forming a main combustion chamber, said main combustion chamber having a wedge shaped apex near the extended axis of said piston, a main intake valve and a exhaust valve each having a head portion projecting into said main combustion chamber, walls forming an auxiliary combustion chamber, said auxiliary combustion chamber being positioned within said engine adjacent said main combustion chamber apex and the bottom wall of said auxiliary combustion chamber projecting into said main combustion chamber, a plurality of torch openings establishing communication between said chambers, means for igniting a mixture in said auxiliary combustion chamber to cause flames to project through said torch openings to ignite a mixture in said main combustion chamber, a first of said torch openings being positioned to direct a flame toward and across the face of said main intake valve, a second of said torch openings being positioned to direct a flame toward and across the face of said exhaust valve, and at least one additional torch opening positioned opposite said first and second torch openings to direct a flame toward a region of said main combustion chamber remote from said valves, the axis of both said first and second torch openings being approximately parallel to the upper wall of said main combustion chamber and directed toward the top most portion of the main combustion chamber side wall to produce maximum torch flame lengths and promote effective combustion.

4,144,849

LIQUID-COOLED INTERNAL COMBUSTION ENGINE

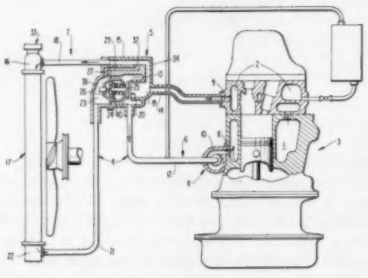
Wolfram Dahm, Nürtingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,081

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615727

Int. Cl.[2] F01P *11/02, 11/04, 7/16*

U.S. Cl. 123—41.54 **8 Claims**



1. A liquid-cooled internal combustion engine having a cooling medium outlet and a control of the cooling medium temperature of its cooling medium circulation, comprising a circulating pump having a suction connection, thermostatically operating mixing valve means, said mixing valve means including a mixing chamber means, the suction connection of said circulating pump being interconnected in the cooling medium circulation in substantially open communication with the mixing chamber means, radiator means having an inlet, an outlet, and inlet and return lines for the cooling medium, a return chamber means operatively connected with the cooling medium outlet of the radiator means by way of the cooling medium return line, a return control valve means for closing off the return chamber means with respect to the mixing chamber means, and a by-pass channel means operatively connected with the cooling medium outlet of the internal combustion engine and by-pass control valve means for closing off the by-pass channel means with respect to the mixing chamber means, said mixing valve means further including a cooling medium outlet means operatively connected with the cooling medium inlet of the radiator means by way of a radiator inlet

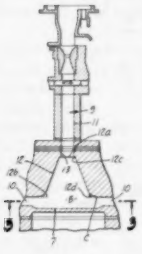
line, and vent means for the return chamber means including an auxiliary chamber means which includes a vent connection at a geodetic high place in the cooling medium circulation serving for the air separation, characterized in that two vent lines are provided, the auxiliary chamber means being arranged in series between said two vent lines, one of the vent lines being operatively connected with the return chamber means and the other vent line being operatively connected with the radiator inlet line in a manner enabling said circulating pump to supply cooling medium to said auxiliary chamber means via said other vent line so as to form a liquid seal in said auxiliary chamber means for preventing air from being drawn into the cooling system by the circulating pump upon an opening of the return control valve means due to the maintenance of said liquid seal being independent of the position of said return control valve means.

4,144,850

AUXILIARY INTAKE PASSAGE FOR INTERNAL COMBUSTION ENGINES

Urataro Asaka, Kamifukuoka, and Hitoshi Ohara, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1977, Ser. No. 760,528
Claims priority, application Japan, Jan. 28, 1976, 51/7464
Int. Cl.[2] F02B *75/18*
U.S. Cl. 123—52 M **6 Claims**



1. For use with an internal combustion, spark ignition engine having a main carburetor to provide the engine with a lean mixture and an auxiliary carburetor to provide the engine with a rich mixture, an auxiliary intake passage system comprising, in combination: an auxiliary intake distribution chamber having a bottom wall heating surface, branch passage means extending from said chamber, an induction passage connecting said auxiliary carburetor to said chamber, said induction passage having a flow alignment passage with an internal surface of substantially constant cross-sectional area and having a tapered portion receiving flow of mixture from said flow alignment passage, said tapered portion being tapered to enlarge in the direction of flow, said tapered portion having an internal wall outside a projection of the internal surface of said flow alignment passage; and

said auxiliary intake distribution chamber heating surface having a depressed portion of substantially uniform depth positioned opposite said tapered portion, the cross sectional area of said heating surface depressed portion being larger than the maximum cross sectional area of said tapered portion.

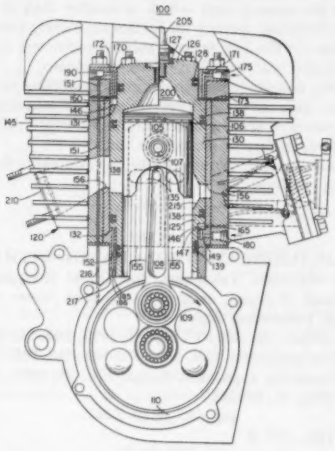
4,144,851

VARIABLE COMPRESSION RATIO ENGINE

Gildo G. Prosen, Chicago, Ill., assignor to Promac Corporation, Glenview, Ill.

Filed Jan. 24, 1977, Ser. No. 762,109
Int. Cl.[2] F02B *75/04*
U.S. Cl. 123—78 C **14 Claims**

1. In an internal combustion engine having a combustion chamber, means for automatically varying the volume of the combustion chamber comprising, a cylinder having inner and outer sleeves, said inner sleeve defining at least a portion of the combustion chamber, first and second fluid chambers formed by said inner and outer sleeves, means connecting said first and second fluid chambers to a fluid supply to provide a constant



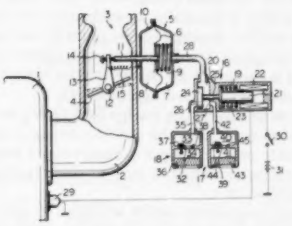
source of fluid to said chambers, and means responsive to the pressure in the combustion chamber for varying the volume of fluid in said first and second chambers causing relative movement of said inner and outer sleeves to control the combustion chamber volume in response to pressure in the combustion chamber.

4,144,852

METHOD OF CONTROLLING A THROTTLE VALVE AND A THROTTLE VALVE OPENING CONTROL DEVICE

Noriaki Kawai, Okazaki, and Heisuke Yamamoto, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 31, 1977, Ser. No. 802,057
Claims priority, application Japan, Mar. 24, 1977, 52-31610
Int. Cl.[2] F02D *33/02, 11/08;* F02M *23/04*
U.S. Cl. 123—97 B **7 Claims**



1. A throttle valve control device of an internal combustion engine which has a carburetor with a throttle valve in an intake passage, said device comprising:

control means for temporarily holding the throttle valve during a first length of time at a predetermined opening degree, which is slightly greater than an idling opening degree of the throttle valve when the throttle valve is rapidly closed after completion of the warm-up of the engine, and for temporarily holding the throttle valve at the predetermined opening degree during a second length of time, which is longer than said first length of time when

the throttle valve is rapidly closed before completion of the warm-up of the engine;

first restricting means having a first restricted opening for restricting the flow rate of the air flowing in said first restricted opening;

second restricting means having a second restricted opening with an opening area which is smaller than that of said first restricted opening for further restricting the flow rate of the air flowing in said second restricted opening as compared with said first restricting means;

switching means for selectively interconnecting said control means with the atmosphere via either of said first restricting means or said second restricting means in response to the temperature of the engine, and;

a resilient member for urging the throttle valve towards its idling position.

4,144,853

IGNITION TIMING CONTROL CHANGE-OVER SYSTEM

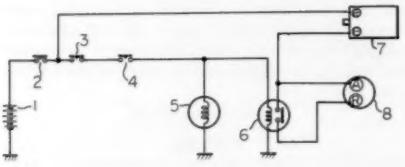
Hiroyuki Maruoka, Yokohama, and Giichi Shioyama, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 348,027, Apr. 5, 1973, Pat. No. 3,896,913. This application Oct. 28, 1976, Ser. No. 736,774

Claims priority, application Japan, Apr. 28, 1972, 47/43185; Sep. 12, 1972, 47/106283

Int. Cl.[2] F02P 5/04

U.S. Cl. 123—117 R **6 Claims**



1. An ignition timing change-over system for a vehicle internal combustion engine having an intake manifold, a throttle valve, an acceleration contol member, a gear shift lever and a pedal actuated clutch, the system comprising, in combination:

an ignition coil;

a distributor provided with an advancing breaker point and a retarding breaker point for advancing and retarding spark ignition timing in dependence on engine speed;

an electrically operated change-over type relay switch, the coil of which is normally de-energized for the switch to connect said advancing breaker point to said ignition coil, and is energized for the switch to connect said ignition coil, and is energized for the switch to connect said retarding breaker point to said ignition coil;

means for more advancing the ignition timing at said retarding breaker point than the ignition timing at said advancing breaker point during a predetermined engine operating condition including at least engine cranking;

a d.c. power source;

an ignition change-over circuit arranged to close when said engine is idling under given conditions for connecting said relay switch coil through an ignition switch to said d.c. power source to energize said relay switch coil causing said relay switch to switch and connect said ignition spark retarding breaker with said ignition coil, said ignition change-over circuit including a thermostatic switch mounted on a catalytic converter in the exhaust system of said engine and adapted to close at a catalyst temperature below a predetermined level, and a throttle switch which is adapted to close when said throttle valve is in the engine idling position; and

a throttle valve opener comprising solenoid means connected in parallel with said relay switch coil for opening said throttle valve when said ignition change-over circuit is closed and said ignition spark retarding breaker point is connected to said ignition coil.

4,144,854

IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

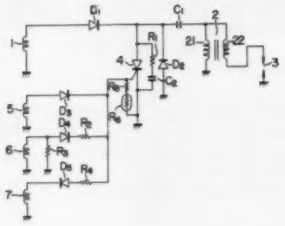
Hirosi Katada, Nakamachi; Nobuhiko Ogasawala, Mito, and Hideyuki Hashimoto, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

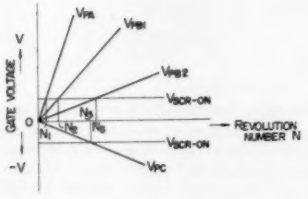
Filed Jun. 1, 1977, Ser. No. 802,464

Claims priority, application Japan, Jun. 9, 1976, 51-67315

Int. Cl.[2] F02P 5/04

U.S. Cl. 123—117 R **4 Claims**





1. An ignition apparatus for use with an internal combustion engine, comprising:

an ignition coil connected with a power source and having primary and secondary windings;

an electric switching element having a control electrode and being connected with said primary winding of said ignition coil to form a closed electric circuit therewith; and

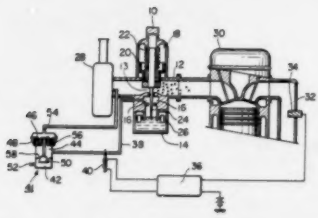
signal generating means connected to said control electrode for operating said electric switching element with an automatically-advancing ignition timing in accordance with the increase in the signal voltage obtained from said signal generating means resulting from the increase in the speed of the engine;

said signal generating means comprising first signal generating means for delivering a first output at low engine speeds, second signal generating means for delivering a second output having a sloping characteristic covering a range of ignition angles representing a range of engine speeds over which the ignition is to be advanced, third signal generating means providing a third output at the maximum ignition advance position to limit advance of the ignition timing, and means for producing a composite output from said first, second and third outputs for application to said control electrode.

4,144,855
DEVICE FOR CONTROLLING THE AIR-FUEL RATIO OF A MIXTURE

Takatoshi Masui, and Masaki Mituyasu, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 15, 1976, Ser. No. 723,752
Claims priority, application Japan, Jun. 9, 1976, 51-66497
Int. Cl.[2] F02M *7/02*
U.S. Cl. 123—119 EC **2 Claims**



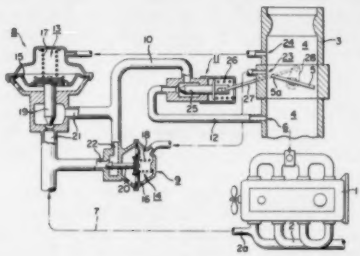
1. A device for controlling the air-fuel ratio of the mixture supplied to an internal combustion engine having a Venturi-type carburetor, comprising:
- a sensor provided in an exhaust passage of the engine and detecting the concentration of oxygen contained in the exhaust gas;
- an electromagnetic valve arranged in an air bleed passage of said carburetor, which passage is controlled so as to be either opened or closed by said valve in accordance with a signal from said sensor, and;
- another valve comprising an air valve arranged in said air bleed passage, which air valve continuously controls the quantity of the air passing through said air bleed passage in accordance with the quantity of suction air being introduced into a combustion chamber, said air valve being a diaphragm valve comprising
- a diaphragm which is actuated by the dynamic pressure of the suction air being introduced into the combustion chamber,
- a dynamic pressure chamber communicated with an intake passage in the vicinity of an air cleaner,
- a counter chamber communicated with said air bleed passage and separated from said dynamic pressure chamber by said diaphragm,
- an air chamber communicated with the atmosphere,
- a valve opening formed between said counter chamber and said air chamber, and
- a valve member connected to said diaphragm so as to change the opening area of said valve opening and controlling the quantity of the air passing through said air bleed passage.

4,144,856
EXHAUST GAS RECIRCULATION SYSTEM

Yutaka Tsukamoto, Johyoh, and Tatsuro Nakagami, Kyoto, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1977, Ser. No. 804,852
Claims priority, application Japan, Nov. 25, 1976, 51-141602
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **2 Claims**

1. An exhaust gas recirculation system for an internal combustion engine including at least one exhaust gas passage therefrom and at least one throttle valve containing intake passage thereto, comprising an exhaust gas recirculation passage means communicating between said exhaust gas passage and said intake passage of the engine to lead a portion of the exhaust gas to said intake passage, first and second vacuum-operated flow control valves in the recirculation passage means in a parallel relationship with each other, a third flow control valve in the recirculation passage means in series with said first and second control valves said third control valve being mechanically linked to said throttle valve in said intake passage of the engine to open in response to opening of said throttle valve, and multiple ports in the inner wall of said intake passage, one port positioned at a point adjacent to one end of said throttle valve

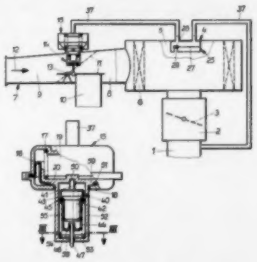


in its closed position communicating with said second control valve and providing vacuum for the operation thereof, another port positioned upstream of said throttle valve in its closed position communicating with said first control valve, and providing vacuum for the operation thereof.

4,144,857
DEVICE FOR AUTOMATICALLY CONTROLLING THE INTAKE AIR TEMPERATURE OF A CARBURETOR-EQUIPPED INTERNAL COMBUSTION ENGINE

Lothar Bendig, Ludwigsburg, and Arthur Klotz, Neckargröningen, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,781
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1976, 2646936
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 D **9 Claims**



1. A device for controlling the intake air temperature of an internal combustion engine which is equipped with a carburetor in its air intake system and an air filter upstream of the carburetor, and which has a raw air mixing duct leading into the air filter from an intake duct junction formed by a cold air intake duct through which is taken in raw air of ambient temperature and a warm air intake duct through which is taken in preheated raw air coming from an exhaust stove, for example, and valve means associated with said intake duct junction for adjusting the relative flows of raw air through said cold air intake duct and warm air intake duct by progressively opening one duct while at the same time closing the other duct, said air temperature controlling device comprising in combination:
- a pneumatic valve actuator with an actuator return spring;
- a drive connection between the valve means and said valve actuator;

a vacuum line leading from a point downstream of the carburetor to said actuator, the line being so connected thereto that the negative pressure supplied by said line moves the actuator against the actuator return spring, in the sense of opening the warm air intake duct and closing the cold air intake duct;

a thermostat-controlled relief valve arranged in the vacuum line, at a point where its thermostatically sensitive element responds to the temperature of the mixed intake air flow, said valve being so adjusted that an increase in temperature of the mixed air flow progressively increases the opening of a relief port in the vacuum line, thereby correspondingly reducing the negative pressure which is being supplied to the valve actuator, thus resetting the valve means in the direction of closing the warm air intake duct;

thermostatically responsive means in the drive connection between the valve means and the valve actuator for increasing and decreasing the effective length of said connection, when the temperature of the air flowing through the cold air intake duct increases or decreases, respectively, so that a rise in the ambient temperature results in a resetting of the valve means in the direction of closing the warm air intake duct; and

abutment means arranged in said drive connection, in opposition to said actuator return spring and at a point of said connection which is located operatively between the actuator and the thermostatically responsive means, for stopping the actuator return movement in a position in which the effective length of the drive connection, as determined by a comparatively high ambient temperature level, causes the valve means to close the warm air intake duct, and in which the effective length of the drive connection, as determined by a comparatively low ambient temperature level, causes the valve means to partially open the warm air intake duct.

4,144,858

FUEL SUPPLY APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

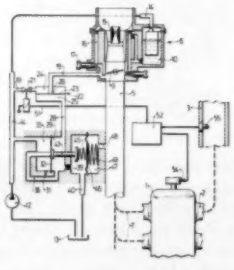
Johannes-Gerhard Bertling, Vaihingenan der Enz, and Werner Schiele, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,738

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620385

Int. Cl.[2] F02M *69/00*

U.S. Cl. 123—139 AW **8 Claims**



1. A fuel supply apparatus for an internal combustion engine, said engine having an air induction tube containing an externally settable throttle valve; and said apparatus including fuel metering means for supplying fuel to said induction tube, said fuel metering means comprising an electromagnetic valve, control means for controlling the amount of fuel supplied by said metering means, said control means being arranged to provide electric control pulses to said fuel metering means the frequency of which is dependent on engine speed (rpm), and pressure operated flow control means for gauging the pressure in said induction tube downstream of said throttle valve and for providing a further control of the flow of fuel supplied to said induction tube, the improvement in said apparatus comprising:

said pressure operated flow control means includes a bicameral equal pressure valve having a control chamber and a valve chamber for providing said further control of the flow of fuel; and

a differential pressure valve for controlling the pressure in said control chamber of said bicameral equal pressure valve.

4,144,859

OVEN-ROTATION PREVENTION METHOD AND CIRCUIT IN THE NON-CONTACT TYPE IGNITION CIRCUIT FOR THE INTERNAL COMBUSTION ENGINE

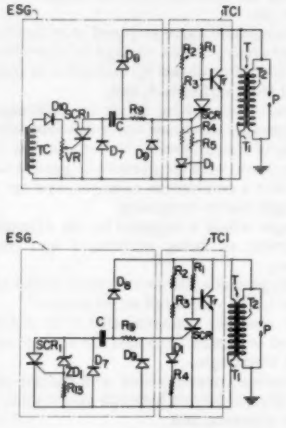
Yoshinori Ohki, and Komiya Hirokichi, both of Tokyo, Japan, assignors to Iida Denki Kogyo K.K., Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,462

Claims priority, application Japan, Dec. 15, 1975, 50-149297; Dec. 15, 1975, 50-149298; Feb. 9, 1976, 51-13028; Mar. 4, 1976, 51-23592; Apr. 8, 1976, 51-39754; Apr. 16, 1976, 51-43181; Apr. 19, 1976, 51-44272; Apr. 26, 1976, 51-47525; Apr. 27, 1976, 51-52954

Int. Cl.[2] F02P *1/00, 9/00*

U.S. Cl. 123—148 CC **9 Claims**



1. An overrotation prevention circuit in a non-contact ignition circuit for an internal combustion engine, comprising:

an ignition coil, the secondary winding of said ignition coil being connected to a spark gap, the primary winding of said ignition coil when having a forward voltage induced therein, carrying a current which flows when a first gated thyristor is non-conducting, said current flowing through a transistor connected by its emitter and collector across said primary winding, and said current and said transistor are cut off to cause a spark at said gap when said first gated thyristor is caused to conduct;

a capacitor being connected in a undirectional charging circuit across said primary winding, said capacitor being charged when said primary winding has an inverse voltage induced therein;

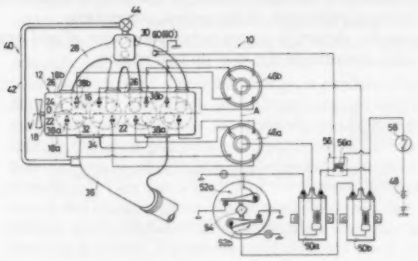
a discharge circuit for discharging said capacitor after said charging, said discharging current causing said first thyristor to continue in a non-conducting state, whereby sparking at said gap is delayed;

a switching circuit, said switching circuit causing said capacitor to discharge when the rotation rate of said engine exceeds a selected limit.

4,144,860
DUAL SPARK PLUG IGNITION ENGINE

Shigeo Muranaka; Yasuo Takagi, both of Yokohama; Yasushi Araki, Tokyo, and Katsuyo Kakuta, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 13, 1977, Ser. No. 787,211
Claims priority, application Japan, Apr. 16, 1976, 51-47487[U]
Int. Cl.[2] F02P 3/06
U.S. Cl. 123—148 C **13 Claims**



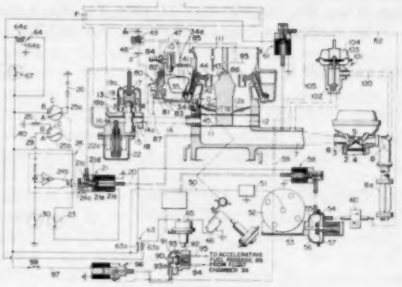
1. An internal combustion engine, comprising:
means defining a combustion chamber between a cylinder head and the crown of a piston reciprocally movably disposed in an engine cylinder;
first and second spark plugs disposed in the combustion chamber so that both said spark plugs function substantially the same during normal engine operating range;
means for recirculating a portion of exhaust gases discharged from the engine into the combustion chamber;
first transforming means for transforming an electric current from an electric source into a high tension current, electrically connected to said first spark plug;
second transforming means for transforming the electric current from the electric source into a high tension current, electrically connected to said second spark plug;
switching means for interrupting the electrical connection between said first transforming means and the electric source when actuated; and
sensing means for sensing engine operation in a high power output engine operating range to actuate said switching means.

4,144,861
FUEL SUPPLY FOR INTERNAL COMBUSTION ENGINES

Ryuichi Yamashita; Hiromitsu Matsumoto, both of Hamamatsu, and Masato Eda, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 12, 1976, Ser. No. 685,540
Claims priority, application Japan, May 17, 1975, 50-58862
Int. Cl.[2] F02N 17/00
U.S. Cl. 123—179 G **10 Claims**

1. Internal combustion engine comprising intake passage means leading to combustion chamber means and provided with throttle valve means, main carburetor means for providing a supply of air-fuel mixture, starting fuel supply means having starting fuel supply passage means of a cross-sectional area which is small in relation to that of the intake passage means and opening at one end to the intake passage means downstream of the throttle valve means and at the other end to atmosphere, starting fuel discharge means discharging starting fuel into said starting fuel supply passage means so that the fuel discharged from the starting fuel discharge means to the starting fuel supply passage means is mixed with air passing therethrough to form an air-fuel mixture, starting valve means provided in the starting fuel supply passage means downstream of the starting fuel discharge means, said starting valve means being connected with a movable wall defining a vacuum chamber at one side in such a manner that when a negative pressure is introduced to said vacuum chamber said starting valve means is moved to a position where it closes the starting fuel supply passage means, spring means biasing the starting valve

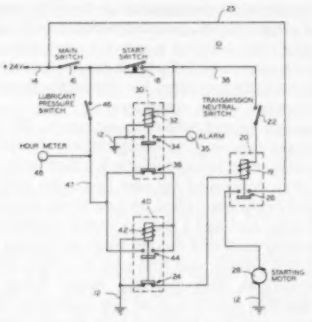


means to an open position, means for connecting the vacuum chamber with the intake passage means at engine temperature above a predetermined value, and exhaust passage means connected with said combustion chamber means.

4,144,862
ENGINE STARTING SYSTEM

Michael H. Estkowski, St. Joseph, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Oct. 31, 1977, Ser. No. 847,294
Int. Cl.[2] F01M 1/18
U.S. Cl. 123—196 S **2 Claims**



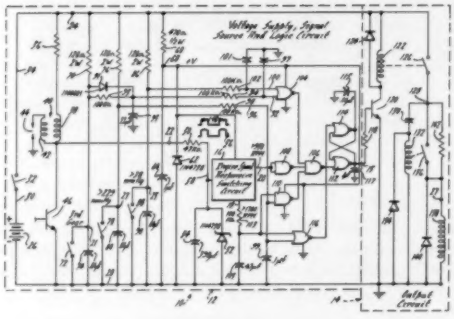
1. An engine starting system comprising a circuit portion connectible between the two sides of an electrical energy source and including in sequence a main switch, a start switch and a device for energizing the engine starter, a first electrically operated relay having a predetermined operating time and embodying a normally closed switch, a second electrically operated relay having a longer operating time than said first relay and embodying a normally open switch and a second normally closed switch, means for connecting said first relay between one side of the energy source and said circuit portion between said start switch and said device, a normally open switch responsive to engine lubricant pressure, means for connecting said second relay and said engine lubricant switch in sequence between said one said of the energy source and said circuit portion between the main switch and the start switch, said last named means including a parallel connection embodying said first normally closed switch and said normally open switch, and said second normally closed switch being connected in circuit with said device.

4,144,863

CIRCUIT FOR CONTROLLING THE OPERABILITY OF ONE OR MORE CYLINDERS OF A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Richard V. Abdoo, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 716,865, Aug. 23, 1976, Pat. No. 4,104,991.
This application Dec. 21, 1977, Ser. No. 862,706
Int. Cl.[2] F02D *13/06*
U.S. Cl. 123—198 F **2 Claims**



1. In a system for controlling the operability of one or more cylinders of a multi-cylinder internal combustion engine, said system including:

(a) electrically controllable means for disabling at least one cylinder of said internal combustion engine;

(b) circuit means for sensing a plurality of conditions of operation of said engine;

(c) logic circuit means, responsive to said sensing circuit means, for generating electrical signals for controlling the energization or de-energization of disabling means; and

(d) output circuit means, coupled between said logic circuit means and said disabling means for controlling electrical energy supplied to said disabling means in response to said electrical signals generated by said logic circuit means;

the improvement which comprises:

(e) relay means, in said output circuit means, for controlling the energization and de-energization of said disabling means, said relay means including a first relay coil and a first switch controlled by said first relay coil, said first relay coil being controlled by said logic circuit means, a second relay coil and a second switch controlled by said second relay coil, said second relay coil being controlled by said first switch, said first switch having first and second conditions, said disabling means being energized when said first switch is in its first condition and de-energized when said first switch is in its second condition, and said second switch having first and second conditions, said second switch when in its second condition reducing the power dissipated by said disabling means when energized as compared to the power dissipated by said disabling means when energized when said second switch is in its first condition.

4,144,864

METHOD AND APPARATUS FOR DISABLING CYLINDERS UNDER LIGHT LOAD CONDITIONS BY COMPARISON WITH VARIABLE REFERENCE

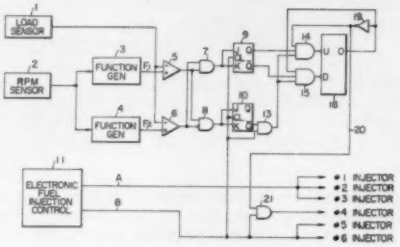
Fumiaki Kato, Yokohama; Haruhiko Iizuka, and Junichiro Matsumoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 27, 1977, Ser. No. 801,415
Claims priority, application Japan, May 31, 1976, 51-62287
Int. Cl.[2] F02D *13/06;* **F02B** *3/00*
U.S. Cl. 123—198 F **6 Claims**

1. A method for operating a multi-cylinder internal combustion engine on a varying number of its cylinders as a function of an operating parameter of said engine, comprising establishing a high reference variable as a function of the engine revolution per unit time and a low reference level variable as a function of the engine revolution per unit time, increasing the number of working cylinders when the engine load is above said higher reference level, decreasing the number of working cylinders when the engine load is below said lower reference level, and maintaining the number of said working cylinders when the engine load lies between said high and low reference levels.

2. Apparatus for operating a multi-cylinder internal combustion engine on a varying number of cylinders as a function of an operating parameter of the engine, comprising:

means for detecting an operating parameter of said engine representative of the load on said engine;



means for detecting the revolution per unit time of said engine;

means for setting a high reference level variable as a function of the detected engine revolution;

means for setting a lower reference level variable as a function of the detected engine revolution; and

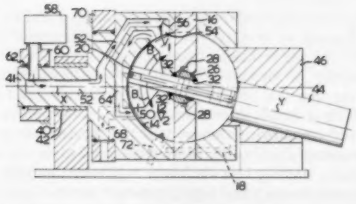
injection control circuit means including means for increasing the number of active cylinders when the detected engine load is above said higher reference level, means for decreasing the number of active cylinders when the detected engine load is below said lower reference level, and means for maintaining the number of active cylinders when the detected engine load lies between said high and low reference levels.

4,144,865

FLUID DISPLACEMENT APPARATUS

Leon A. Konopeskas, 728 Whetter Ave., London, Ontario, Canada (N6C 2H3)

Division of Ser. No. 573,946, May 2, 1975, Pat. No. 4,036,566.
This application Mar. 18, 1977, Ser. No. 779,092
Claims priority, application Canada, May 7, 1974, 199185
Int. Cl.[2] F02B *53/00*
U.S. Cl. 123—241 **4 Claims**



1. An internal combustion engine comprising:

(a) a body having a chamber defined therein, at least a portion of the inner surface of such chamber being in the form of a concave spherical segment and having an axis of symmetry,

(b) partition means sealingly engaged with said chamber and defining an enclosed space therewith,

(c) a baffle defining an imaginary plane extending through said partition means in sealing engagement therewith and movable relative thereto about pivot means defining a first pivot axis lying in the plane defined by said baffle, the orientation of the first pivot axis being fixed relative to said chamber and located in an imaginary plane defined by said partition and perpendicular to and intersecting the axis of symmetry of the chamber, and wherein said baffle is connected to said partition means by said pivot means, said pivot means also defining a second pivot axis about which said baffle pivots relative to said chamber, said first and second pivot axes intersecting one another and being mutually perpendicular to one another,

(d) said baffle having a peripheral edge, a portion of which defines an arc of a circle to sealingly engage said inner surface of said chamber in relatively movable relation thereto such that said baffle is capable of oxcillating motion relative to said chamber about said first pivot axis whereby to vary the volumes of the regions located between said inner surface and said partition on the opposing sides of said baffle, said baffle defining an axis lying in the plane of the baffle and intersecting said first pivot axis,

(e) port means and valve means communicating with said chamber for permitting or effecting inflow and outflow of fluid from said chamber during the occurrence of said oscillating motion of said baffle relative to said chamber, said port means including a valved fuel-air intake port for admitting a fuel-air mixture of a region on one side of the baffle, and an exhaust port for releasing spent exhaust gases from that one of said regions in which combustion takes place, and means for igniting a compressed fuel-air mixture in said one of said regions to effect combustion of and expansion of said gases,

(f) rotatable shaft means operatively connected to at least one of said baffle and said chamber for rotation of said shaft means about an axis during said oscillating motion of the baffle relative to said chamber such that expansion of said gases effects the oxcillating motion of said baffle relative to said chamber and consequent rotation of the shaft means.

4,144,866

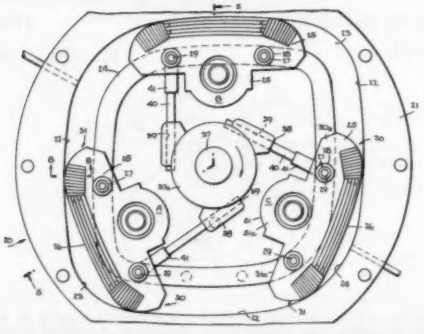
INTERNAL COMBUSTION ROTARY ENGINE

Robert Hakner, 2050 21st Dr., Brooklyn, N.Y. 11214

Filed Nov. 14, 1977, Ser. No. 851,485

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—241 **34 Claims**



1. A rotary internal combustion engine comprising:

(a) an annular housing having a plurality of inner walls extending about the interior of the housing and facing the central axis of the housing with the length of adjacent walls intersecting at a predetermined angle to one another to form a corner portion therebetween;

(b) a plurality of rotating sliding pistons each having a face portion with its length extending in the direction of the length of adjacent walls of the annular housing, the length of the face portion of the piston enabling the piston to be substantially contiguous at the end portions of the face portion to adjacent inner walls of the annular housing while the face portion forms a chamber with respect to the corner portion of adjacent inner walls, the chamber being adapted to function as one of an intake chamber for receiving an intake charge and an expansion chamber in which products of combustion are expanded, the face portion of the piston being substantially contiguous with an inner wall of the annular housing when the end portions of the face portion are adjacent the corner portions connected to the inner wall to which the face portion is contiguous, each piston having a pair of oppositely disposed side portions extending from the face portion thereof toward the central axis of the annular housing, each piston having an internal passage extending within the piston from a side portion to the face portion thereof, the internal passage being adapted to communicate with a chamber formed by the face portion of the piston to provide a flow path with respect thereto and being adapted to provide a combustion chamber within the piston into which the intake charge is compressed when the face portion of the piston is substantially contiguous with an inner wall of the annular housing;

(c) an end plate disposed at each of the opposite sides of the annular housing and extending substantially at right angles to the central axis of the housing for covering the side portions of the pistons adjacent the inner walls of the annular housing, the end plates in conjunction with the face portion of a piston and the corner portion of adjacent inner walls completing the chamber adapted to function as an intake chamber or an expansion chamber;

(d) means disposed within the annular housing and responsive to pressure of products of combustion in an expansion chamber for guiding each piston to rotate with respect to the central axis of the housing and to slide with respect to the inner walls of the housing with the end portions of the face portion of the piston being adjacent intersecting inner walls of the housing when the face portion of the piston is adjacent the corner therebetween and with the face portion of the piston being substantially contiguous with an inner wall of the housing when the end portions of the face portion are adjacent the corner portions of the inner wall to which the face portion is contiguous, the sliding of the piston with respect to the corner portion of intersecting adjacent inner walls sequentially forming the chambers between the piston and the intersection of adjacent inner walls, the guiding means enabling forces applied to a piston by the expanding of combustion products in an expansion chamber to rotate the pistons with respect to the central axis of the housing and to slide with respect to the inner walls of the housing;

(e) a shaft extending substantially along the central axis of the annular housing;

(f) means for connecting each sliding piston to the shaft with the pistons being spaced apart from one another;

(g) means for cyclically delivering a charge to the portion of the internal passage within a piston adjacent the side portion of the piston, the charge being adapted to pass through the internal passage of the piston and into the intake chamber formed between the face portion of the piston and the corner portion of intersecting adjacent inner walls of the annular housing; and

(h) means for cyclically removing expanded products of combustion of the charge from the internal passage within the piston adjacent a side portion thereof, the expanded products of combustion thereby being removed from the expansion chamber formed between the face portion of

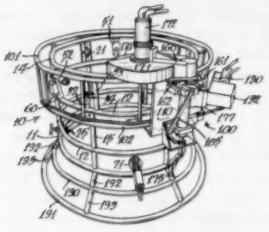
the piston and the corner portion of intersecting adjacent inner walls of the housing.

4,144,867

CONCRETE PILE-CUTTING MACHINE

Edward H. Wachs, Chicago, and Horst Kwech, Gurnee, both of Ill., assignors to The E. H. Wachs Company, Wheeling, Ill.

Filed Sep. 29, 1977, Ser. No. 837,835
Int. Cl.[2] B28D *1/04*
U.S. Cl. 125—14 **8 Claims**



1. A pile cutting machine for concrete piles and the like comprising, an annular elongate open-ended frame with fixed integral members having an interior opening of a size to receive a concrete pile therein and with said frame in surrounding relation thereto, first and second sets of guide members on said frame with said sets being vertically spaced apart, said first set being at the lower end of the frame to initially align the frame relative to the concrete pile as the frame is lowered into surrounding relation therewith and said second set being adjacent the upper end of the frame to coact with the first set and guide the frame for lowering movement along the concrete pile, first and second sets of movable clamps mounted on said frame with said sets being vertically spaced apart to engage against said concrete pile and hold said frame in position, annular track means on said frame, a cutter head movably mounted on said annular track means, and means for propelling said cutter head along the annular track means.

4,144,868

CHISEL FOR AN IMPACT APPARATUS

Hermanus A. Heitbrink, Kampioenstraat 11, Enschede, Netherlands

Filed Jul. 5, 1977, Ser. No. 812,694
Claims priority, application Netherlands, Jul. 6, 1976, 7607465
Int. Cl.[2] B28D *1/26*
U.S. Cl. 125—41 **9 Claims**

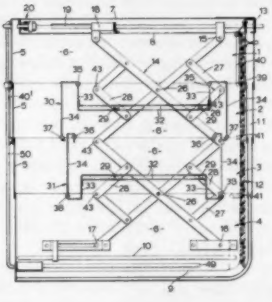
1. A chisel for impact apparatus, said chisel being of elongate form and presenting a stem at one end adapted to be attached to an impact apparatus, and a blade portion joined to said stem and projecting longitudinally therefrom to define the opposite end of the chisel, and said blade portion terminating in a transverse edge; a plurality of teeth disposed in spaced relation to each other along said transverse edge, each tooth being disposed in a plane extending longitudinally of said blade portion and perpendicular thereto, each tooth being of a width greater than the thickness of said blade portion and extending beyond said transverse edge to terminate in at least one bit; and said blade portion including a plurality of longitudinally extending grooves, each groove extending from said transverse edge between an adjacent pair of said teeth.

4,144,869

DOMESTIC LOW TEMPERATURE AND WARMING UNIT

Gerald A. Oatley, Palma Lodge, Mill La., Codsall, Staffordshire, England

Filed May 9, 1977, Ser. No. 794,914
Int. Cl.[2] A21B *1/52*
U.S. Cl. 126—19 M **13 Claims**



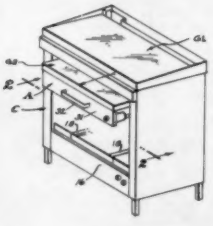
1. A domestic oven and warming unit comprising a chamber which is variable in volume and defined by top, bottom, back and side walls and a door at the front; and means for heating the chamber, the door being variable in size with changes in volume of the chamber.

4,144,870

ADJUSTABLE BROILER CONVECTION OVEN

Howard R. Reynolds, 1551 21st St., Manhattan Beach, Calif. 90266

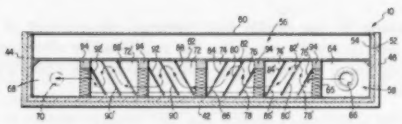
Filed Dec. 10, 1976, Ser. No. 749,316
Int. Cl.[2] F24C *3/08*
U.S. Cl. 126—41 E **6 Claims**



1. An adjustable broiler stove including, a cabinet of panels forming an oven chamber, radiant heat means disposed horizontally within the top of the oven chamber, a food supporting and contacting griddle and underlying heat means moveable within the oven chamber, and elevator means comprised of upper and lower lift arms arranged in trapezium formation

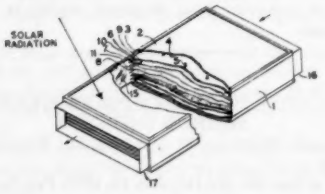
swinging from spaced pivots carried by the cabinet and extending to spaced pivots carrying the griddle and heat means, the last mentioned pivots being more closely spaced than the first mentioned pivots whereby the said griddle is increasingly displaced from horizontal as it is raised in selectively positioning the said griddle in spaced relation to said radiant heat means.

4,144,871
SOLAR HEAT COLLECTOR
Donald F. Porter, 130 Ramsey Pl., Albany, N.Y. 12209
Filed Mar. 7, 1977, Ser. No. 775,042
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **8 Claims**



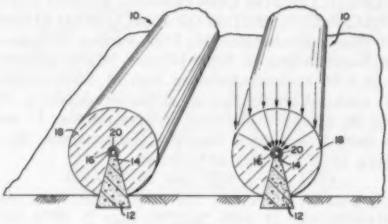
1. A solar heat collector comprising, in combination:
- a body defining an enclosed space including spaced side walls and provided with outer and inner windows disposed in spaced relation to each other to define an outer insulating compartment between said windows and an inner heating compartment below said inner window;
- a plurality of permeable heat transfer devices disposed in spaced relation to each other and transverse to said side walls within said heating compartment to divide the interior thereof into a series of chambers communicating serially with each other through said permeable heat transfer devices;
- an air inlet communicating with one end chamber of said heating compartment and an air outlet communicating with the other end chamber of said heating compartment, and baffle means in others of said chambers for creating lateral spreading and serpentive air flow serially through said chambers, said baffle means lying transverse to said walls; and
- insulating strip means interposed between said heat transfer devices and said inner window, and wherein said baffle means comprises a series of spaced, toothed plates extending in directions parallel to said heat transfer devices.

4,144,872
SOLAR ENERGY COLLECTOR
Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.
Filed Apr. 13, 1976, Ser. No. 676,548
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **11 Claims**



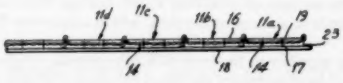
1. A solar collector for collecting radiant energy and transferring it as heat to a moving air stream, comprising a housing, means to provide an air stream through said housing, at least one translucent cover mounted on said housing for the entrance of radiation into said housing, and a plurality of laterally spaced apart partially translucent heat absorbing sheets mounted in said air stream, substantially parallel to and coextensive with said cover, whereby a portion of said entering radiation is absorbed by substantially every part of each successive partially translucent sheet and transmitted to said air stream as heat.

4,144,873
APPARATUS FOR REFRACTING, CONCENTRATING AND COLLECTING SOLAR RADIATION
C. Kenneth Blanton, #49 Pahlavi Pahlavan, Tehran, Iran
Filed Jun. 21, 1976, Ser. No. 697,704
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **5 Claims**



1. A device for refracting, concentrating and collecting radiant solar energy comprising:
- an oblong pedestal having a generally triangular cross section and plural spacing elements extending along the pinnacle of said pedestal;
- a heat absorbing hollow cylinder carried by said spacing elements of said pedestal;
- a transparent, generally cylindrical member comprising a solid, refractive material of uniform thickness carried by said pedestal and encircling at least a portion of said cylinder for concentrating and transferring substantially all of the radiant energy incident to the periphery of said member to said heat absorbing cylinder, said refractive member being relatively thicker than the cross sectional dimension of said hollow cylinder;
- said refractive member comprising a cylinder having a section removed, with said pedestal occupying said removed section, the axis of said refractive member being substantially coaxial with the axis of said hollow cylinder;
- a plurality of said pedestal-cylinder-refractive member combinations, each combination lying with axes of said cylinders substantially parallel with one another and substantially normal to the mean inclination of radiation of the sun.

4,144,874
SOLAR PANEL
William H. Zebuhr, Nashua, N.H., assignor to Sunhouse, Incorporated, Nashua, N.H.
Filed Jun. 10, 1977, Ser. No. 805,562
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **13 Claims**



1. A solar radiation absorbing member comprising:
- a plurality of substantially coplanar elongated fluid passageways extruded together joined side by side to form an integrally extruded unit comprising longitudinal edges;
- a radiation-transmissive cover extending over all of said coplanar passageways and spaced from said passageways

on one side thereof and joined to the outermost ones of said passageways adjacent said longitudinal edges to form an air-tight channel with said passageways as one wall section thereof;

supporting rib means extending from said extruded unit parallel to said passageways and in the direction away from said cover to support said extruded unit spaced from a base structure to minimize heat transfer from said extruded unit to said base structure; and

means to hold both of said longitudinal edges in substantially fixed relationship to said base structure.

4,144,875

SOLAR COLLECTOR COMPRISING AN ENTRANCE WINDOW CONSISTING OF EVACUATED TUBES

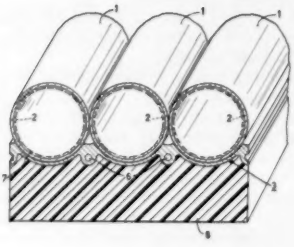
Richard Bruno, Kirchstrasse 82, 5100 Aachen; Wilhelm Hermann, Bundesstrasse 20; Horst Hörster, Vogelsangstrasse 11, both of 5106 Roetgen; Reinhard Kersten, Meischenfeld 29, 5100 Aachen-Kornelimünster; Klaus Klinkenberg, Waldstrasse 39; Faramarz Mahdjuri, Ardennenstrasse 75, both of 5100 Aachen, and John Bannigan, Hammstrasse 46, 5190 Stolberg, all of Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,944

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615475; May 21, 1976, 2622750; May 29, 1976, 2624214

Int. Cl.[2] F24J *3/02;* **F28F** *1/10*

U.S. Cl. 126—271 **15 Claims**



1. A solar collector, which comprises a plate-shaped heat exchanger having a corrugated profile, said heat exchanger being provided with a plurality of ducts and serving to transfer heat derived from collected solar radiation during operation to a heat transport medium fed through said ducts, and a heat-insulating entrance window for solar radiation consisting of a plurality of sealed and evacuated transparent tubes adjacently arranged in contact with each other, the tube portions facing the heat exchanger being in contact with the corrugations therein, and said tube portions and said corrugations being of complementary shape.

4,144,876

HAIR IMPLANTING METHOD

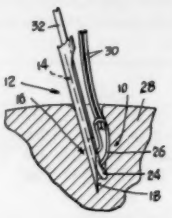
David B. DeLeo, 126 Sturges Rd., Wilton, Conn. 06897

Filed Dec. 20, 1977, Ser. No. 862,767

Int. Cl.[2] A61B *17/00*

U.S. Cl. 128—1 R **8 Claims**

1. The method of attaching an anchorage member for hair-like strands to an area of the skin, which comprises the steps of placing essentially the entire elongate base portion of an anchorage member in the bore of a hypodermic needle having a slot, and simultaneously placing a tie portion of said anchorage member in said slot whereby a major part of said tie portion lies substantially outside of the theoretical confines of the cylindrical outer surface of the needle and extends in directions generally transverse to the needle axis, piercing the skin with said needle, advancing the base portion of the anchorage member forwardly along said bore and simultaneously advancing said tie portion along the slot of the needle and into the skin so as to be embedded therein, the engagement with the skin of the said tie portion of the anchorage member causing a deformation of the same with respect to the base portion of the anchorage member so as to enable both portions to pass through the



hole made by the needle with minimal enlargement of said hole, and thereafter removing the needle while allowing the base portion of the anchorage member to remain embedded in the skin.

4,144,877

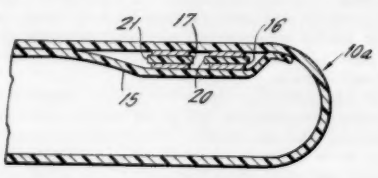
INSTRUMENT FOR VISCOELASTIC MEASUREMENT

Ephraim H. Frei; Bruce D. Sollish, and Shmuel Yerushalmi, all of Rehovot, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovoth, Israel

Filed Aug. 12, 1976, Ser. No. 713,891

Int. Cl.[2] A61B *5/10*

U.S. Cl. 128—2 S **14 Claims**



1. A transducer head for palpation of living breast tissue comprising, in combination: at least first and second pressure transducer means spaced from one another and mounted on a common base having a independently for engaging a plurality of fingers; said transducer means having sufficient sensitivity to detect viscoelastic changes in breast tissue; said first and second transducer means being generally flat and thin, and being normally disposed in a generally common plane; each of said transducer means having electrical output leads insulated from one another; and circuit means including differential output measuring means connected to each of said transducer means for determining a difference in output between said first and second transducer means when said first and second transducer means are pressed against spaced areas of living breast tissue, thereby to determine local thickened regions in said living breast tissue.

4,144,878

OCCLUSIVE IMPEDANCE PHLEBOGRAPH AND METHOD THEREFOR

H. Brownell Wheeler, 540 Salisbury St., Worcester, Mass. 01609

Division of Ser. No. 481,115, Jun. 19, 1974, Pat. No. 3,996,924. This application Dec. 13, 1976, Ser. No. 750,336

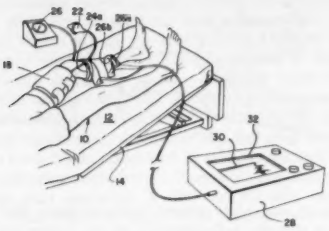
Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 V **19 Claims**

1. A method of detecting a clot obstructing a substantial portion of a vein in the limb of a human comprising the steps of

A. measuring the resting baseline impedance through said limb,

B. blocking the venous return to the heart from said limb and measuring the impedance change through said limb in response to said blockage to thereby determined the venous capacitance of said limb, and



C. measuring the rate of change of impedance through said limb on unblocking the venous return to thereby determine the venous outflow rate,

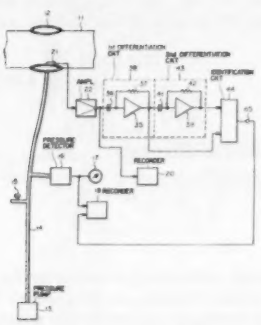
D. a venous outflow rate and venous capacitance within a predetermined range of values as defined in FIG. 3 defining the presence or absence of a clot.

4,144,879

BLOOD PRESSURE MEASURING INSTRUMENT

Kiyoshi Nakayama, Koganei, and Shinichi Yagi, Hino, both of Japan, assignors to Zaidanhojin Nipponrodobunkakyokai, Tokyo, Japan

Filed Apr. 15, 1977, Ser. No. 788,097
Claims priority, application Japan, Apr. 19, 1976, 51-44622
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 A **9 Claims**



1. A blood pressure measuring instrument comprising:

pressure means for applying a pressure by a cuff to a blood vessel of a test subject from the outside thereof;

pressure changing means for gradually changing the pressure;

a pressure sensor disposed in contact with the test subject beneath the cuff for converting into an electric signal a pressure change resulting from movement of the blood vessel while the pressure to the blood vessel is gradually changed;

a differentiation circuit coupled to said pressure sensor for differentiating twice the converted output from the pressure sensor;

identifying means coupled to said differentiation circuit for detecting the generation of a characteristic waveform consisting of three closely successive pulses comprising a first-polarity pulse followed by a second-polarity pulse which is in turn followed by another first-polarity pulse; and

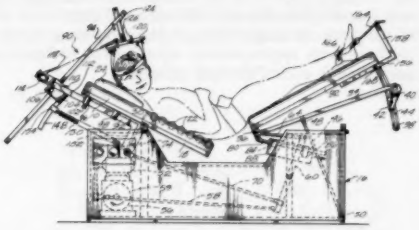
means responsive to the output of said identifying means for measuring, as the highest and lowest blood pressures respectively, the pressures applied to the cuff by the pressure means at the first and last detections of said characteristic waveform by the identifying means.

4,144,880

ORTHOPEDIC TABLE

E. Robert Daniels, 638 W. Duarte Rd., Arcadia, Calif. 91006

Filed Mar. 11, 1977, Ser. No. 776,862
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—71 **28 Claims**



1. An orthopedic table for applying controlled flexion to the lower back of a patient comprising:

(a) a table divided in a mid-region of its length to form an upper platform for supporting the back of a patient and a lower platform for supporting the legs of a patient, the platforms having respective inner edges extending across the divided mid-region;

(b) means for tilting the upper and lower platforms about corresponding longitudinally spaced apart pivot axes to increase the mid-region separation between the inner edges of the platforms;

(c) means for holding a lower portion of the patient's body in a fixed position on the lower platform;

(d) pelvic strap means secured to the lower platform and extendible under a rear pelvic region of the patient's body and extendible over a front pelvic region of the patient's body to hold the patient's pelvic region in a fixed position on the lower platform, and means for securing the pelvic strap means tightly around the pelvic region of the patient to force the patient's lower back into flexion in the separation space between the platforms in response to increased pressure on the front pelvic region of the patient from the pelvic strap means during separation of the platforms;

(e) means for holding an upper portion of the patient's body to apply traction to the patient's body during separation of the platforms; and

(f) means for releasably securing the lower platform in a desired angle of inclination to selectively control the amount of flexion applied to the patient's lower back during separation of the platforms;

(g) the means for tilting the lower platform including means for moving the inner edge of the lower platform along a substantially straight path during separation of the platforms to produce substantially constant traction on the patient's lower back and hamstrings.

4,144,881

APPAREL WORN FOR THE AID AND PROTECTION OF THE BODY AND FOR THE SUPPORT AND ASSISTANCE OF IMPAIRED JOINT FUNCTION

Cluff E. Chappell, 2121 Valencia, NE., Albuquerque, N. Mex. 87110

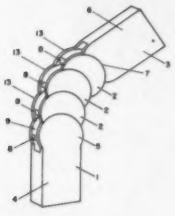
Filed Jun. 6, 1977, Ser. No. 803,865
Int. Cl.[2] A61F *3/00*
U.S. Cl. 128—80 R **4 Claims**

1. A protective orthopedic prosthetic device comprises:

a means for attaching the device to the limb or body of the wearer,

a base member being generally flat having an attaching end which attaches or is inserted into the means for attaching the device to the body of the wearer, and the base member having a convex semi-circular end whose edge has a T-shaped groove,

a plurality identical of crescent shaped discs having a convex edge whose cross-section is a T-shaped groove identical to the T-shaped groove of the base member, and each crescent shaped disc having a concave edge whose cross section is a T-shaped tongue which is sized to slideably fit the T-shaped groove of the base member and other crescent shaped discs; the concave edge and the convex edge of the crescent shaped discs being circular arcs whose radii are both approximately equal to the radius of the semi-circular end of the base member;



and an end piece being generally flat having an attaching end which attaches or is inserted into the means for attaching the device to the limb or body of the wearer, and having a concave semi-circular end whose cross section is a T-shaped tongue which is sized to slideably mate and fit the T-shaped groove in the crescent shaped disc and the T-shaped groove in the base member, the radius of the concave semi-circular end of the end piece being approximately equal to the radius of the semi-circular end of the base member,

and a plurality of stop blocks, being two for each T-shaped groove, each step-block having a threaded tap at its approximate center said threaded tap passing clear through the stop-block, the stop-block being sized to loosely slideably fit the T-shaped groove in the base member and crescent shaped discs,

and a plurality of threaded set screws to screw into and through the threaded taps,

and an optional means for aiding joint dysfunction.

4,144,882

DEVICE FOR EXPOSING TEETH TO RADIATION OF ULTRASONIC WAVES

Kiyochika Takemoto, Kodaira; Yasuo Suzuki, Higashi Kurume; Yoshihito Ochiai, Fujisawa; Syozi Nakashima, Ninomiya, and Midori Hayashi, Yamakita, all of Japan, assignors to Lion Hamigaki Kabushiki Kaisha, Japan

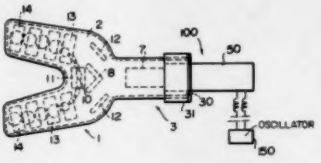
Filed Dec. 17, 1976, Ser. No. 751,270

Claims priority, application Japan, Dec. 20, 1975, 50-152209

Int. Cl.[2] A61M *31/00*

U.S. Cl. 128—172.1 **15 Claims**

1. In a device for exposing teeth, contacted by a decay-retarding agent, to radiation of ultrasonic waves for forming on the teeth a reinforcing layer of said agent, ultrasonic wave generating means for generating ultrasonic waves and directing the latter generally toward the teeth to be treated, support means adapted to be situated adjacent the teeth to be treated for supporting said generating means in proximity to the teeth to be treated, and reflecting-and-transmitting plate means carried by said support means adapted to be situated between said generating means and the teeth in the path of travel of the waves emanating from said generating means for receiving the waves from said generating means and transmitting part of the waves through said plate means to teeth situated at the side of said plate means opposite from said generating means and for reflecting part of the received waves away from the teeth at



the side of said plate means opposite from said generating means, so that the reflected part of the waves can be utilized for treating teeth in addition to those situated at the side of said plate means opposite from said generating means.

4,144,883

SPIROMETER

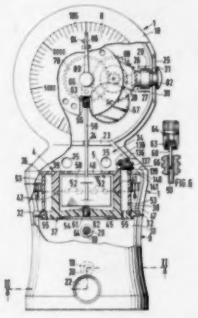
Eugen Grieshaber, Höchst 5, 7821 Eisenbach, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,374

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614752

Int. Cl.[2] A61B *5/08*; G01F *1/06*

U.S. Cl. 128—2.08 **14 Claims**



1. A spirometer, comprising a housing having walls defining a cylindrical turbine chamber, an antechamber having a blow-in opening and having an annular portion around said cylindrical turbine chamber and a plurality of passages extending from the annular portion tangentially into the turbine chamber, a small-diameter shaft extending into said turbine chamber and centrally mounted for free rotation therein, an air wing rotor secured to said small-diameter shaft and located in said turbine chamber for rotation by the blowing air directed in through the blowing opening and said antechamber and through the passages into the turbine chamber, said air wing rotor comprising a thin flat plate which is at least approximately conformable to the inner contour of said cylndrical turbine chamber, said plate being centrally secured to said small-diameter shaft, said cylindrical turbine chamber including a cylindrical wall of said housing having a space therearound and provided with said passages which comprise obliquely radially extending air inlet openings distributed around the circumference thereof, said space around said cylindrical wall defining said annular chamber portion, said housing having at least one outlet opening from said cylindrical turbine chamber to the outside, said housing having a portion with a dial having indications thereon, a pointer shaft with a pointer and a drag shaft with a drag pointer rotatably mounted in said housing over said dial,

said pointer and said drag pointer being movable over the dial to indicate the blowing rate, a high-ratio reduction gearing connected between said small-diameter shaft and said pointer shaft and said drag shaft to rotate said pointer and said drag pointer upon rotation of said shaft, a manually operable, disconnectable coupling means connected between said shaft and said pointer shaft for disengaging said pointer shaft, a zero return spring means acting on said pointer shaft to bias it towards a zero position, a return knob connected to said drag shaft for moving said drag pointer manually back to zero separately from said pointer, and frictional brake means connected between said drag shaft and said housing for resisting the movement of said drag shaft, said thin flat plate forming a double-wing rotor blade positioned in said cylindrical turbine chamber at a location such that air from said obliquely radially extending air inlet openings is directed radially obliquely against said rotor blade to rotate said small-diameter shaft, wherein said housing includes a hollow cylindrical two-part body, said parts being formed lockably engageable and having a lower handle portion defining said turbine chamber and and said antechamber and an upper dial-forming portion joined to said handle portion, said annular chamber portion having a closed bottom wall and a top wall with a central opening therein defining the turbine chamber, said annular chamber portion around said turbine chamber being separable along a median plane into upper and lower portions, said bottom having bores therethrough communicating said antechamber to said annular chamber portion, said passages being defined at the separating plane of the wall portion defining the boundaries of said turbine chamber.

4,144,884

DOUBLE LUMEN CATHETER

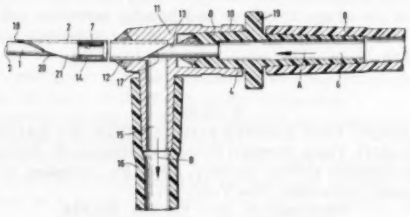
Bernd J. W. Tersteegen, and Günther Van Endert, both of Kreuzstrasse 19, D-4000 Dusseldorf 1, Fed. Rep. of Germany

Filed Mar. 17, 1977, Ser. No. 778,720

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613281

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—214.4 **8 Claims**



1. A double lumen catheter for use in extra-corporal dialysis, which comprises ducts for blood streams flowing into and respectively out of the body, an inner cannula providing an inner duct, an outer cannula surrounding the inner cannula and providing between the inner cannula and the outer cannula an outer duct, said outer cannula being disposed in co-axial relationship with respect to said inner cannula, a front end of the outer cannula being inclined obliquely to the longitudinal cannula axis and sharply ground to facilitate puncture of a blood vessel, the front end portion of the inner cannula being bent with respect to the longitudinal cannula axis, the magnitude of the bend of said front end portion of said inner cannula being sufficient to locate the leading end of said front end portion in a position bearing against an inner wall of said outer cannula, and means mounting said inner cannula for axial movement relative to said outer cannula from (1) a withdrawn insertion position wherein the front end of the inner cannula is positioned inwardly of the front end of the outer cannula so that the sharply ground front end of the outer cannula can puncture a blood vessel, (2) to an extended operative position wherein the front end of the inner cannula extends to least to the front end of the outer cannula, whereby engagement between the sharply ground front end of the outer cannula and the front end portion of said inner cannula prevents the sharply ground front end of the outer cannula from damaging the blood vessel once the double lumen catheter has been inserted therein.

4,144,885

APPARATUS FOR THE DETACHABLE CONNECTION OF A PISTON WITH A PISTON PLUNGER

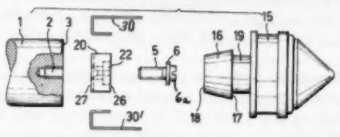
Donald P. Stait, Steinmaur, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Aug. 1, 1977, Ser. No. 820,925

Claims priority, application Switzerland, Aug. 31, 1976, 11008/76

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—218 P **4 Claims**



1. An apparatus for the detachable connection of an axial to-and-fro movable piston of a syringe with a piston plunger, comprising:

at least two holder brackets arranged in spaced relationship from one another and detachably secured with the piston plunger;

each of said holder brackets being formed of a spring wire;

each of said holder brackets comprising two respective essentially axially extending webs and a connection element arranged transversely with respect to said webs;

a headpiece constructed in the form of a substantially truncated conical member provided for the piston of the syringe; and

said headpiece having a contact edge with which engage said connection elements.

4,144,886

ABSORBENT LAMINATE

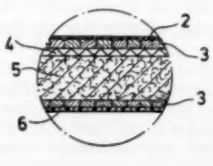
Arno Holst, and Helmut Lask, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 26, 1976, Ser. No. 735,445

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547650

Int. Cl.[2] A61F *13/16*; B32B *3/26, 5/18, 21/06*

U.S. Cl. 128—284 **12 Claims**



1. In an absorbent laminate comprising a first layer of cellulose flock, at least one layer of a tissue having an absorbent carbohydrate derivative on at least one face and a covering fleece, the tissue layer being positioned between the fleece and the first layer,

the improvement comprising that the absorbent carbohydrate derivative is selected from the group consisting of a crosslinked cellulose ether, a cross-linked starch ether,

and a starch grafted with acrylonitrile and subsequently saponified.

4,144,887

DIAPER WITH TAB FASTENER HAVING BACKING WEB AND FACE WEB

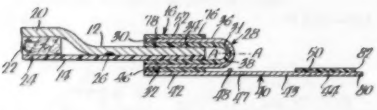
John P. Milnamow, North Barrington, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 617,902, Sep. 29, 1975, Pat. No. 3,987,793. This application Oct. 20, 1976, Ser. No. 734,205

The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **10 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a backing web folded over to form first and second anchoring legs each having an inner face and an outer face, said web extending around and receiving a marginal portion of the diaper therebetween, and said inner face of said anchoring legs being provided with an adhesive coating by means of which said anchoring legs are permanently attached to the diaper marginal portion;

a face web having a fixed end permanently attached to said second leg, a grippable adhesive-free region at the opposite end of said face web, and a free working portion situated between said fixed end and said adhesive-free region, said free working portion being provided with a layer of pressure-sensitive adhesive on one face thereof; and

release means releasably attached to said adhesive layer on said free working portion;

said grippable adhesive-free region extending inwardly away from said lateral margin of the diaper and beyond said release means and said first leg of said backing web, and said free working portion being separable from said release means to make said free working portion available for use in securing said diaper about an infant.

4,144,888

DEVICE FOR TREATMENT BY LASER EMISSION

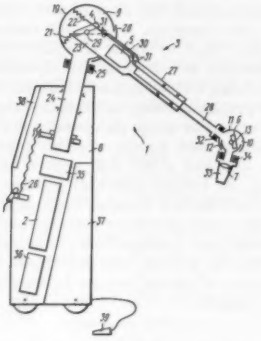
Boris N. Malyshev, ulitsa Butlerova, 24, kv. 219; Vladimir N. Prozorov, Varshavskoe shosse, 87, kv. 89, and Igor I. Gonel-Budantsev, 1 Dobryninsky pereulok, 9, kv. 5, all of Moscow, U.S.S.R.

Filed Sep. 15, 1976, Ser. No. 723,546

Int. Cl.[2] A61N *5/01*

U.S. Cl. 128—303.1 **2 Claims**

1. A device for treatment by laser emission, comprising: a laser; a wavebeam guide for transmission of emission of said laser to a selected point of a patient, said wavebeam guide being provided with only two mirrors: an input mirror which is first in the direction of the laser emission propagation and the other being an output mirror located beyond the first mirror in the direction of the laser emission propagation; mounting units for mounting said mirrors so that they can rotate about two axes, one axis coinciding with the axis of the laser beam incident thereon and the other axis perpendicular to said one axis, the mirrors having means for rotation together in relation to the rotation axes of said input mirror, said mounting units also being mounted for variably adjusting the distance therebetween in order to change the distance between said mirrors along the axis of the laser beam reflected by the input mirror; an aiming grip mounted on said wavebeam guide for rotation about the axis of the laser beam reflected by said output mirror and for rotation together with said output mirror about the axis perpendicular to the axis of the laser beam incident on said output mirror; a focusing lens mounted in said grip, said mirror mounting units securing said input and output mirrors at the ends of said wavebeam guide the axis of which coincides with the axis of the laser beam reflected by said input mirror, each of said mirror mounting units comprising two housing members including means for moving the same relative to each other about a common rotation axis; a mirror rotating drive



disposed inside each of said housing members, each drive comprising two coaxial drums having a ratio of diameters equal to one to two and working surfaces, said drums being mounted coaxially about a rotation axis of the respective housing members, and a ribbon engaging said working surfaces of said drums, said ribbon being permanently in a state of tension; a guiding roller for guiding said ribbon mounted at a rotation axis spaced from the rotation axis of the respective housings and drums to thereby provide a gear ratio equal to one to two between said drums; and means for rigidly securing the smaller one of the drums to one of said housing members; and the larger drum being rigidly secured to the respective mirror rotatable about said rotation axis of said housings.

4,144,889

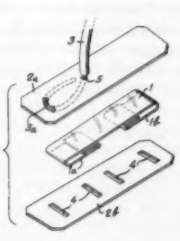
CARDIAC ELECTRODES FOR TEMPORARY PACING

G. Frank O. Tyers, Hershey; Howard C. Hughes, Jr., Cornwall, and Kenneth Gwirtz, Hershey, all of Pa., assignors to Research Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 802,034

Int. Cl.[2] A61N *1/04*

U.S. Cl. 128—418 **19 Claims**



1. A cardiac electrode apparatus comprising:

an electrically conductive electrode member;

an insulating electrical lead having means for conductively contacting said electrode member;

cover means of nonconductive biocompatible material for

insulatingly surrounding said electrode member and holding said contacting means thereunder in conductive contact with said electrode member, said cover means comprising:

a first insulating portion having means therein for exposing a portion of the surface of said electrode member; and

a second insulating portion having means for releasably holding said contacting means in conductive contact with said electrode member in such manner that said contacting means is permitted to be slidably removed from under said cover means upon the imposition of a pulling force on said electrical lead; and

means for attaching said cover means to the heart of a subject with said first insulating portion engaging the heart such that said exposed portion of the surface of said electrode member is held in conductive contact with said heart.

4,144,890

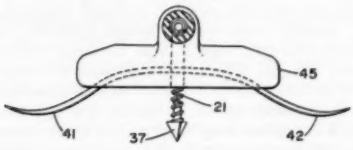
CONTACT DEVICE FOR MUSCLE STIMULATION

Stanley R. Hess, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Division of Ser. No. 688,238, May 20, 1976, Pat. No. 4,066,085, which is a continuation of Ser. No. 540,805, Jan. 14, 1975, abandoned. This application Dec. 19, 1976, Ser. No. 751,386

Int. Cl.[2] A61N *1/04*

U.S. Cl. 128—418 **2 Claims**



1. A pacemaker lead for application to cardiac muscle from outside the heart to effect stimulation, comprising:

a generally flat base of flexible electrical insulating material including one relatively flat face;

a relatively flexible coil of conductive wire extending perpendicularly from said base through said relatively flat face at a location disposed substantially centrally with respect to said base and having an end projecting outwardly of said base;

two pairs of arcuate, pointed hooks partially embedded in said base and protruding through the same relatively flat face of

said base as said coil, said hooks being insulated from said coil, the hooks in each pair facing each other in opposed relationship so that, by bending back said base, the hooks may be drawn apart;

a sharp tip provided at the end of said coil; and a flexible insulated electrical lead-in wire connected to said coil and secured to said base, the wire and the coil being connected within said base,

said lead-in wire extending outwardly from said base to allow its connection to a source of current,

whereby, with the hooks drawn back, said coil may be inserted in cardiac muscle to establish an electrical connection to a pacemaker unit and said hooks can be released to engage the cardiac tissue and serve to anchor said coil and base to the cardiac muscle, said coil riding in nonbinding relationship to said muscle.

4,144,891

HEART STIMULATOR LEAD SET

John P. Lysfjord, Minneapolis, and James K. Byland, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 20, 1977, Ser. No. 789,292

Int. Cl.[2] A61N *1/04*

U.S. Cl. 128—419 P **15 Claims**

1. A set of first and second body-implantable discrete leads adapted to electrically interconnect first and second body tissues and a source of electrical energy, wherein the improvement comprises:

(a) first and second conductors of said first and second leads, respectively;

(b) first and second insulating means encapsulating and electrically insulating, respectively, said first and second leads and each being of a material which is substantially inert to body fluids and tissue;

(c) first and second discrete electrode means connected, respectively, to said first and second leads; and

(d) first and second contact means associated with the source of electrical energy, and including first and second means associated with said first and second leads respectively for ensuring that said second electrode means may only be electrically engaged to the source of electrical energy through said second contact means.

4,144,892

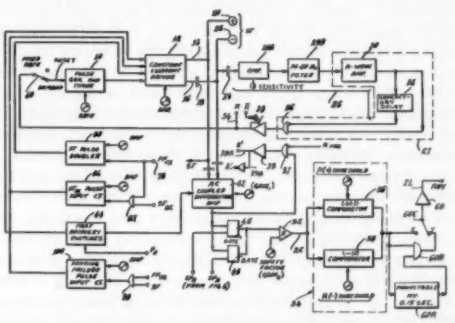
CARDIAC PACER AND MONITOR SYSTEM

Albert A. Auerbach, New York, N.Y., assignor to Medalert Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 664,953, Mar. 8, 1976, Pat. No. 4,088,139. This application Sep. 22, 1976, Ser. No. 725,407

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PT **8 Claims**



1. In a pacer for cardiac stimulation and cardiac condition monitoring comprising a single current path for both stimulation and sensing, generating means coupled to said current path for generating a cardiac stimulation signal, sensing means coupled to said current path for sensing cardiac events, said cardiac events normally including a biphasic cardiac signal having first and second phases properly produced in response to said stimulation signal, and a monitoring means responsive to said sensing means for providing a warning signal in response to one or more sensed improper conditions, the improvement comprising generating a sampling signal in a time frame normally coincident with at least a portion of a normal biphasic cardiac response signal produced in response to said stimulation signal, said sensing means further including means for sensing said first phase response signal, and means responsive to the sensing of said first phase response signal for providing a sampling signal for said second phase response signal during a predetermined time interval after the sensing of said first phase response signal, and a logic means responsive to a lack of coincidence between said sampling signal and the re-

spective expected second phase response signal of a normal biphasic cardiac response signal indicating an improper condition to said monitoring means.

4,144,893

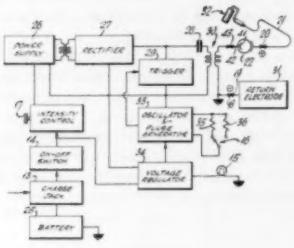
NEUROMUSCULAR THERAPY DEVICE

William Hickey, Short Beach, Conn., assignor to Batrow Laboratories, Inc., Short Beach, Conn.

Continuation of Ser. No. 725,520, Sep. 22, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 844,983

Int. Cl.[2] A61N *1/32*

U.S. Cl. 128—423 R 14 Claims



1. In an electrophysical neuromuscular stimulator of the character indicated, a frame, pulse-generator means carried by said frame and including a ground connection and an output line developing with respect to said ground connection a train of voltage pulses having polarized steep-walled wavefronts, selectively operable means for varying the pulse-repetition rate to enable selection of a rate insufficient to produce tetanic contraction, manually operable means for selectively controlling the amplitude of said voltage pulses, said output line including a sealed elongate tubular dielectric envelope containing a conductive gas and mounted to said frame, an electrode within said envelope at one end thereof and having a conductive connection through said end of said envelope and forming part of said output line, and an output body-electrode coupling connection including a conductive tubular portion having a bore removably assembled in telescoping longitudinal overlap with the other end of said envelope, said conductive tubular portion being longitudinally offset from said electrode, the envelope mounting to said frame comprising body means of insulating material rigidly positioning the electrode end of said envelope and including a tubular shroud overlapping at least the remainder of said envelope and in radial clearance therewith, said coupling connection being supported by said shroud, and radially compliant moisture-absorbent means in circumferential and longitudinal contact with said other end of said envelope and in circumferential and longitudinal contact with the bore of said conductive tubular portion.

4,144,894

RECONSTITUTED TOBACCO COMPOSITION AND PROCESS FOR MANUFACTURING SAME

Otto K. Schmidt, South Windsor, and Robert P. Taylor, Vernon, both of Conn., assignors to AMF Incorporated, White Plains, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,022

Int. Cl.[2] A24B *3/14*

U.S. Cl. 131—17 AC 6 Claims

2. A continuous coherent integral shaped structure comprising a multiplicity of discrete tobacco particles bonded at a plurality of points with an adhesive agent comprising tamarind gum.

4,144,895

SOLVENT EXTRACTION PROCESS

Joseph V. Fiore, Fairfield, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 6, 1975, Ser. No. 556,080

Claims priority, application United Kingdom, Mar. 8, 1974, 10470/74

Int. Cl.[2] A24B *15/02*

U.S. Cl. 131—143 9 Claims

1. A process of treating tobacco to remove lipid therefrom comprising the step of contacting said tobacco with an azeotrope of a hydrocarbon fat solvent and a lower alkanol.

4,144,896

METHOD AND APPARATUS FOR JOINING STRIPS CUT FROM TOBACCO LEAVES TOGETHER TO FORM A RIBBON

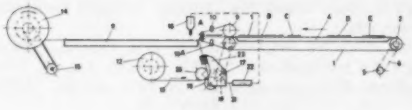
Bernardus Daenen, Uitgeest, Netherlands, assignor to Van Der Molen Machinefabriek B. V., Netherlands

Filed Mar. 4, 1976, Ser. No. 663,707

Claims priority, application Netherlands, Mar. 10, 1975, 7502839

Int. Cl.[2] A24B *3/00*

U.S. Cl. 131—149 15 Claims



13. Apparatus for joining random length strips of tobacco leaves into a continuous band comprising first and second axially aligned conveyors, said first conveyor being movable to cause the transfer of successively spaced strips of tobacco to said second conveyor, said second conveyor including an endless tape arranged to receive said tobacco strips and means located at the forward end of said second conveyor for pulling said tape at a constant speed, means for sensing the length of the respective random length strips of tobacco on said first conveyor, and means automatically responsive to said sensing means for periodically interrupting the movement of said tape corresponding to the length of the tobacco strip sensed for a period sufficient to cause the first conveyor to move each succeeding tobacco strip a distance wherein a narrow marginal portion of the leading edge overlaps a narrow marginal portion of the trailing edge of the preceding strip on being transferred to said second conveyor to thereby form a continuous band of substantial single layer on said endless tape.

4,144,897

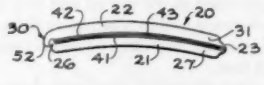
HAIR BLEACHING COMPACT

Karoly Z. Mosz, 11638 Barrington Ct., Los Angeles, Calif. 90049

Filed Apr. 13, 1977, Ser. No. 787,298

Int. Cl.[2] A45D *1/00*

U.S. Cl. 132—9 1 Claim



1. A hair bleaching compact, comprising:

case structure which may be selectively opened and closed, said case structure when closed defining a cavity of selected width, length and depth for holding hair with bleach applied thereto, said case structure defining a hair receiving end through which hair strands may extend into said closed cavity, said hair receiving end having a con-

cave curvature which substantially conforms to the curvature of a person's scalp so that said hair receiving end may be fitted close against a person's scalp to bleach the hair strands down to their roots, said case structure being made of first and second substantially rigid portions which mate to define said cavity, said first case portion defining a well of selected depth into which hair may be placed while bleach is applied thereto, said well functioning to collect applied bleach to prevent same from falling during application onto a person's scalp, said second case portion defining a cover for said well, said case structure further including hinge means which hinge together said first and second case portions, the outside of said case structure being defined by two opposed major surfaces and four edge portions, the first one of said major surfaces being formed by the part of said first case portion defining the bottom of said well and having a concave curvature which is shaped to lie and fit closely against the side of a person's head, the second one of said major surfaces being formed by the part of said second case portion defining the cover for said well, the depth of said cavity defined by said case structure being substantially less than its width and length so that said case structure has a thin substantially flat form, said second major surface substantially conforming in curvature and shape to said first major surface, said first and second major surfaces being disposed in a substantially mutually parallel disposition so several of said hair bleaching compacts may be placed on a person's hair one lying upon the other against the side of the person's head, said four edge portions being defined by the remaining parts of said first and second case portions which mate to define the side walls of said well and cavity and the height of said hair bleaching compact, the first and third of said four edge portions being diametrically opposed and defining the length of said hair bleaching compact, the length of said hair bleaching compact being of a selected limited dimension so that said hair bleaching compact may be used to bleach only a limited length of a strand of hair, the second and fourth of said four edge portions being diametrically opposed and joining the ends of the first and third of said four edge portions to define the width of said hair bleaching compact, the second of said four edge portions defining said concave curved hair receiving end through which hair strands may extend into said closed cavity;

seal means associated with the edges of said case structure for sealing said cavity effectively closed when said case structure is closed to prevent the leakage of bleach therefrom, said hinge means being formed along the third of said four edge portions and said seal means formed along the third of said four edge portions being formed at least in part by said hinge means, said hinge means being a continuous flexible member extending along the length of said hair bleaching compact to hinge together said first and second substantially rigid case portions, said seal means being formed along the fourth of said four edge portions being formed at least in part by flaps carrying gripping surfaces which frictionally adhere to each other when pressed together and can be pulled apart; and

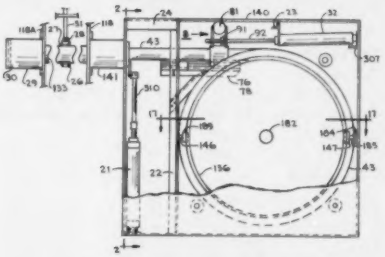
latch means associated with said case structure for selectively latching said case structure closed with strands of a person's head of hair therein, said latch means being formed along the first of said four edge portions and said seal means formed along the first of said four edge portions being formed by said latch means, said latch means being mating lip and groove means.

4,144,898

HOSE REEL AND JET CLEANING MACHINE

John E. Guignon; Helen G. Guignon, both of 12 Chipper Rd., St. Louis, Mo. 63131, and John E. Guignon, Jr., 110 High Valley, Chesterfield, Mo. 63107

Filed Jan. 17, 1977, Ser. No. 760,179
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—113 **14 Claims**



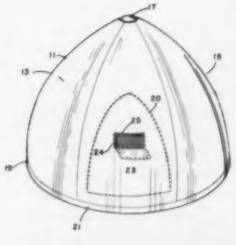
1. A Tank cleaning machine comprising a housing, a hose, a nozzle manifold having one or more nozzles, means of connecting the nozzle manifold to the hose to allow the nozzle manifold to rotate or oscillate without the hose rotating, means to feed the nozzle manifold into and out of a tank being cleaned, means to supply pressurized liquid to the hose end opposite the nozzle manifold, means to control from outside the tank the rate of travel of the nozzle manifold into and out of the tank being cleaned, means to operate the rotation or oscillation of the nozzle manifold from outside the tank with or without liquid flowing, means to vary the degree of the oscillating arc and the speed of this oscillation as well as the speed of rotation if full rotation is desired of the nozzle manifold from outside the tank with or without liquid flowing, means to determine the direction and location of flow of the cleaning liquid from the nozzle, and thus know the area of the tank being cleaned by simply observing the mechanism of the cleaning machine that is outside the tank.

4,144,899

FLEXIBLE-WALLED DEMOUNTABLE GREENHOUSE

Sandra E. Kays, 515 Milledge Heights, Athens, Ga. 30606

Filed Jan. 16, 1978, Ser. No. 869,457
Int. Cl.[2] A45F *1/12, 1/16*
U.S. Cl. 135—1 R **10 Claims**



1. A demountable dome-shaped flexible-walled greenhouse structure comprising

a frame including at least six flexible support rods of round cross-section and a cap having means for engagement with the upper ends of said support rods,

a plurality of wall panels of flexible sheet material equal in number to twice the number of said support rods, said panels being seamed together to form dome-shaped, spaced, double thickness walls for said structure,

said panels having respective sleeves extending in a vertical direction between said walls and dimensioned to accommodate said support rods,

said cap further being formed of at least two parts, the first part containing respective holes, radially arranged to receive each of said rods, and the second being shaped to fit over the first and to capture the upper edge of said panels between said first and second parts,

retaining means secured to said panels near the lower end of said sleeves to receive the ends of said rods,

and means for anchoring said retaining means to the ground.

4,144,900
UMBRELLA

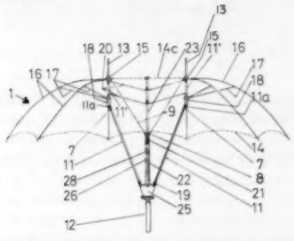
Ernst Kinski, Prinz-Georg-Strasse 94, 4000 Düsseldorf, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,202

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637502; Jun. 28, 1977, 2729026

Int. Cl.[2] A45B *19/00, 25/14*

U.S. Cl. 135—20 A **27 Claims**



1. An umbrella operable to be placed in an opened and a closed condition and including a canopy capable of expansion and contraction to enable adjustment of the area of coverage of said canopy when said umbrella is in said opened condition, said umbrella comprising: handle means enabling said umbrella to be gripped by a user; stick means extending from said handle means to operate as a generally main support element of said umbrella; a canopy; rib means having said canopy attached thereto for supporting said canopy thereupon, said rib means being mounted for movement between an opened and a closed condition of said umbrella; slider means movable relative to said stick means and operably connected with said rib means for moving said canopy and said rib means between an outstretched position when said umbrella is opened and a collapsed condition when said umbrella is closed; said stick means including two individual sticks each pivotally connected with said handle means at one end thereof for movement between a generally parallel position of said two sticks where the opposite ends of said sticks are in relative proximity with each other and a spread position of said two sticks in which said sticks extend in a generally V-shaped configuration from said handle means; with movement of said sticks between said spread position and said generally parallel position operating to expand and contract said canopy to expand and contract the areas of coverage of said umbrella when said umbrella is in said opened condition; and zipper means provided on said canopy, said zipper means being opened to permit spreading of said canopy into said expended condition, with said zipper means operating when closed to place said canopy in said contracted condition and to tend to hold said two sticks in said generally parallel position.

4,144,901
PROBE SYSTEM FOR CONTAINERS

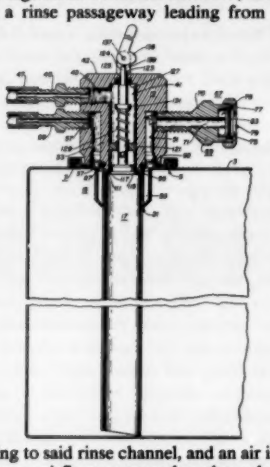
James S. Stevenson, Oakland, Calif., assignor to Terminator Products, Inc., Oakland, Calif.

Filed Jun. 23, 1977, Ser. No. 809,088

Int. Cl. F16k *51/00*

U.S. Cl. 137—240 **15 Claims**

1. In combination, a container adapted to contain a hazardous ingredient such as a pesticide, said container including a wall having a bung opening, and a probe system comprising a circular rinse channel outer wall and bottom within said bung opening and affixed to the rim thereof to constitute an integral part of said container, said channel outer wall having rinse openings therein, and said bottom defining an opening concentric with said channel outer wall for reception of a drop tube, a drop tube in such opening, and coupling means providing an outflow passageway from said drop tube to a point external of said container, for connection to a source of vacuum to withdraw such ingredient from said container, said last means also including a rinse passageway leading from an external



connection fitting to said rinse channel, and an air intake valve assembly having an airflow passage therethrough connecting with said rinse passageway, valve means in said air flow passage responsive to a predominance of atmospheric pressure over pressure in said airflow passageway, to enable intake of air during normal withdrawal of the contents of said container when no rinse liquid is being supplied to said rinse passageway, said valve means being responsive to the rinse liquid during rinsing, for sealing said valve means against flow of rinse liquid therethrough.

4,144,902
ISOLATION VALVE

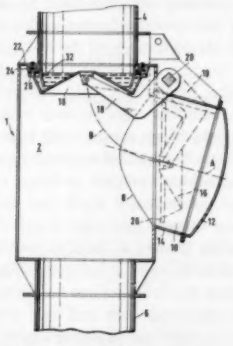
René N. Mahr, Howald-Hesperange, and Pierre H. Mailliet, Howald, both of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Nov. 1, 1976, Ser. No. 737,173

Claims priority, application Luxembourg, Nov. 11, 1975, 73780

Int. Cl.[2] F16K *3/36*

U.S. Cl. 137—246.22 **35 Claims**



1. An isolation valve comprising:

valve body means, said body means being adapted for rigid connection between a pair of spatially displaced conduits and cooperating with said conduits to define a fluid flow path having an axis, said body means including an extension at one side thereof, said valve body means extension

defining a lateral chamber displaced from said fluid flow path, said lateral chamber having an axis which intersects said flow path axis, said valve body means having an annular rim disposed about a first end of said body means, a rigid fluid tight connection being established between said annular rim and the wall of the adjacent conduit section;

a rotatable control shaft, said control shaft passing through said body means;

means positioned to the exterior of said body means for imparting rotary motion to said control shaft;

at least a first valve member disposed within said body means, said first valve member having a sealing surface thereon and defining a liquid receiving and holding vessel which faces in the upstream direction when said valve is closed;

a valve seat, said seat being supported on said valve body and extending about said flow path, said valve seat being affixed to said annular rim and having a frustoconical plate joined to said rim along a line disposed radially inwardly with respect to said flow path axis from said valve seat, said plate extending downwardly into said vessel whereby a liquid barrier to the fluid being controlled will be established between said valve seat and said flow path upstream of said valve member when said vessel is substantially filled with liquid; and

means coupling said first valve member to said control shaft whereby rotation of said control shaft will result in said valve member pivoting between a closed position wherein said sealing surface is in contact with said valve seat and an open position wherein said valve member is disposed within said body means lateral chamber.

4,144,903

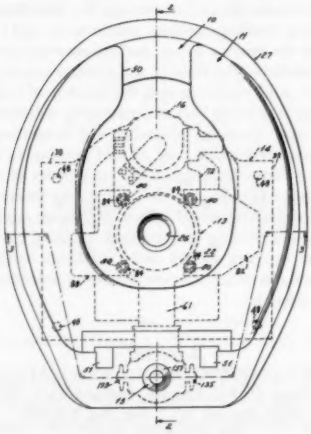
VACUUM FLUSH WATER CLOSET

Charles E. Gregory, Anchorville; Michael Brian, Orchard Lake; Jerald F. Thomas, Utica, and James F. Cameron, Milford, all of Mich., assignors to Jered Industries, Inc., Birmingham, Mich.

Division of Ser. No. 435,511, Jan. 22, 1974, Pat. No. 4,041,554. This application Jun. 6, 1977, Ser. No. 804,234

Int. Cl.[2] F16K *11/14*

U.S. Cl. 137—624.11 **2 Claims**



1. A vacuum and gravity operated timer, comprising:

(a) a housing,

(b) a pair of vacuum flow control valves,

(c) a double faced cam,

(d) said double faced cam being mounted on a pivoted lever arm which has one end pivoted on said housing,

(e) a pair of pivotally mounted carrier arms, each of said carrier arms being engagable with one of said pair of vacuum flow control valves for operating the same, each of said carrier arms having a cam follower means thereon engagable by one of the cam faces on said double faced cam means, and,

(f) a vacuum operated piston operatively mounted in said housing and connected to said lever arm and movable from a lowered inoperative position by vacuum to a raised operative position to raise said double faced cam to a cycle starting position and then movable back to an inoperative position by gravity from said raised operative position to move said double faced cam downwardly and to pivot said carrier arms to operate said vacuum flow control valves.

4,144,904

CONTROL DEVICE FOR THE SPEED CONTROL OF PNEUMATIC AND/OR HYDRAULIC WORKING PISTONS

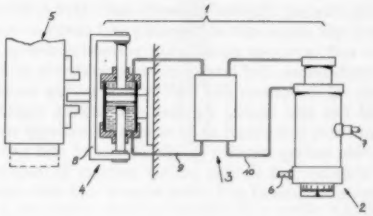
Herbert R. Dits, Adlerring 23, D-6612 Schmelz, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,348

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2625063

Int. Cl.[2] F16K *1/52, 1/54*

U.S. Cl. 137—625.3 **10 Claims**



1. A control device for the speed control of pneumatic and/or hydraulic power pistons and machine elements driven by such power pistons, wherein the control of the power piston speed is effected across at least part of the path of movement of said machine element by the pressure head existing in a liquid flowing in parallel with the movement of operation or sroke of said machine element, said pressure head being produced by throttling means defining throttling orifices or apertures adapted to be set to a constant size or adapted to be varied in accordance with the position of said power piston, characterized in that the first liquid flow is utilized as a signal carrier or transmitter for varying the degree of opening of said throttle orifices (36 or 37), wherein a liquid volume and pressure tranducer (3) having an incrementally variable transmission ratio is interposed between said throttling means (2) and said signal transmitter, and that said throttling means which is equipped with a plurality of differently shaped orifice cross-sections adapted to be selectively placed into action, controls the pressure head of a second oil circuit, said pressure head being adapted to be converted into mechanical power through a piston securely connected to the power piston rod or through the power piston per se.

4,144,905

REVERSING VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

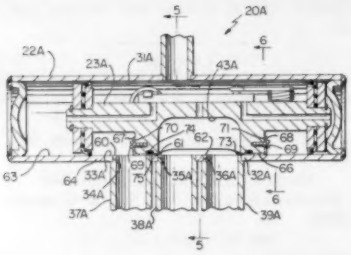
Filed Aug. 19, 1977, Ser. No. 825,957

Int. Cl.[2] F16K *31/363*

U.S. Cl. 137—625.66 **11 Claims**

1. In a reversing valve construction having a housing means provided with a chamber carrying a movable piston-like valve member therein that controls port means of a valve seat means of said housing means through the relative position of a cavity of said valve member relative to said port means, said port

means comprising first, second and third ports disposed in spaced apart and straight line relation and said cavity bridging said first and second ports while exposing said chamber to said third port when said valve member is in one position thereof and bridging said second and third ports while exposing said chamber to said first port when said valve member is in another position thereof, said valve seat means having an arcuate cross-sectional surface and said valve member also having an arcuate cross-sectional surface adjacent said arcuate surface of said valve seat means, the improvement comprising a flexible annu-



lar sealing member disposed between said valve member and said valve seat means and surrounding said cavity to seal said cavity to said valve seat means while permitting sliding movement therebetween, and biasing means operatively associated with said valve member and said flexible sealing member to urge and flex said sealing member into sealing engagement with said valve seat means so as to tend to sealingly conform said flexible sealing member to the contour of said valve seat means whereby said flexible sealing member is intermediate said arcuate surfaces of said valve member and said valve seat means.

4,144,906

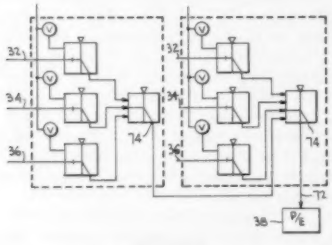
PROGRAMMABLE FLUIDIC PRESSURE-TO-ELECTRONIC INTERFACE SYSTEM

Maurice F. Funke, Columbia, Md., and John M. Goto, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 14, 1977, Ser. No. 815,624

Int. Cl.[2] F15C *1/12*

U.S. Cl. 137—819 **4 Claims**



1. A programmable fluid logic module for providing an interface between a plurality of fluid input signals and a pressure-to-electric transducer comprising:

a plurality of first fluidic logic devices each having first and second input channels for receiving first and second inputs and an output channel producing an output signal only when said first and second inputs are not the same and producing no output signal when said first and second inputs are the same;

first connecting means for connecting each of said first input channels to a source of supply fluid;

second connecting means for providing input signals to each of said second input channels;

a second fluidic logic device having a plurality of input channels and an output channel which produces an output signal only when any of said plurality of input channels of said second logic device receives an input signal; and

third connecting means for connecting each one of said output channels of said first logic devices to one of said input channels of said second logic device.

4,144,907

DEVICE FOR STABILIZING FLOW THROUGH RADIAL BORES IN ROTATING HOLLOW CYLINDERS, ESPECIALLY HOLLOW SHAFTS OF GAS TURBINES

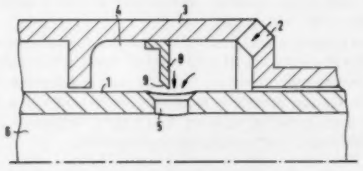
Otto A. v. Schwerdtner, Mülheim, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,562

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1976, 2610783

Int. Cl.[2] F15D *1/02, 1/08*

U.S. Cl. 138—39 **3 Claims**



1. Device for introducing gaseous cooling medium into the hollow shaft of a gas turbine from an annular stationary chamber surrounding said hollow shaft, comprising a housing for said annular stationary chamber including an outer cylindrical wall spaced from said hollow shaft and having a cooling medium inlet opening at one side thereof, said hollow shaft comprising a hollow rotating cylinder surrounded by said annular stationary chamber and having an inner cylindrical wall formed with nozzle-like radial openings for introducing a flow of the gaseous cooling medium received in said stationary chamber into the interior of said hollow rotating cylinder and means for stabilizing the flow of the gaseous cooling medium through said radial openings into the interior of said rotating cylinder, said stabilizing means comprising a stationary ring disposed in said stationary chamber and extending radially from said outer cylindrical wall of said housing to a location close to said hollow rotating cylinder in vicinity of said radial openings formed therein, said stationary ring partly covering said radial openings against the flow of gaseous medium flowing through said cooling medium inlet opening into said stationary chamber, part of said radial openings being exposed directly to said stationary chamber for communicating in radial direction therewith.

4,144,908

PIPE PLUGGING DEVICE AND METHOD

Edward E. Dunn, 1018 S. Cottage, Independence, Mo. 64050

Filed Sep. 19, 1977, Ser. No. 834,695

Int. Cl.[2] F16L *55/12*

U.S. Cl. 138—93 **8 Claims**

1. A method for installing a fitting in a conduit for hazardous gases, said method comprising:

(a) severing said conduit at a point thereon, thereby forming upstream and downstream conduit segments;

(b) providing a distensible temporary plug having a vent tube and a supply tube connected therewith;

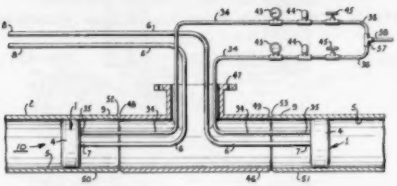
(c) inserting said distensible plug in a central aperture por-

tion of said upstream segment; said vent and supply tubes being threaded through said fitting;

(d) connecting said supply line to a source of pressurized fluid;

(e) pressurizing said distensible plug, whereby an expansible marginal portion of said plug abuts and seals against an inside surface of said upstream conduit segment;

(f) positioning a free end of said vent tube at a location remote to said severing point and communicating said upstream conduit segment with said remote location, whereby said hazardous gases are transmitted through



said vent tube to the atmosphere at said remote location to prevent leakage about said expansible marginal portion and consequent exposure to persons in the vicinity of said severing point;

(g) connecting said fitting to the upstream segment of said conduit while said vent tube is communicating the upstream conduit segment with said remote location;

(h) depressurizing said distensible plug; and

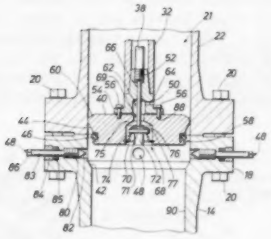
(i) withdrawing said plug from said conduit by towingly pulling the same through said conduit upstream segment and said fitting.

4,144,909

APPARATUS FOR CLOSING SIDE OPENINGS INTO PIPELINES

George W. Harrison, Houston, Tex., assignor to Team, Inc., Alvin, Tex.

Filed Jun. 25, 1975, Ser. No. 590,269
Int. Cl.[2] F16L *55/10*
U.S. Cl. 138—94 **10 Claims**



1. Apparatus for closing a side opening into a pipeline, comprising

a conduit adapted to be attached to the exterior of the pipeline around the side opening into the pipe, said conduit having a tapered annular shoulder around its interior,

a plug adapted for insertion into said conduit and having a tapered annular seating surface disposed about its periphery for sealingly mating with said tapered shoulder of said conduit for forming a first fluid-tight seal therebetween, said plug having a peripheral sealing means disposed about said periphery of said plug forward of said annular seating surface for sealingly engaging the interior of said conduit for forming a second fluid-tight seal therebetween, said plug further having an annular surface disposed about its upper periphery, and

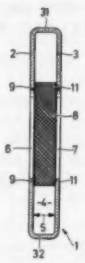
a plurality of screws disposed in said conduit and having a fluid-tight seal disposed therebetween and adapted upon retraction to permit passage of said plug transversely of said screws and upon insertion to permit the inner ends of said screws to engage said annular surface disposed about the upper periphery of said plugs for locking said plug in place in said conduit.

4,144,910

FLAT HOLLOW SECTION MEMBER FOR A TEXTILE MACHINE

Hartmann Bader, St. Georgenstrasse 13, 8400 Winterthur, Switzerland

Filed May 3, 1977, Ser. No. 793,256
Claims priority, application Switzerland, Jun. 8, 1976, 7171/76
Int. Cl.[2] D03C *9/06*; D03D *49/00*
U.S. Cl. 139—91 **16 Claims**



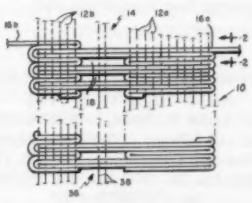
1. A flat hollow section member of a textile machine comprising a pair of oppositely disposed inter-connected walls, at least one of said walls having at least one aperture therein and an insert of vibration-demping material received between said walls in alignment with said aperture, said insert being of a corresponding peripheral shape to said aperture and being of a size between said walls greater than said aperture to abut against said one wall peripherally about said aperture.

4,144,911

CONNECTOR COMPONENTS

Robert S. Veith, Marlboro, Mass., assignor to Thomas Taylor and Sons, Inc., Hudson, Mass.

Continuation of Ser. No. 702,968, Jul. 6, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,436
Int. Cl.[2] D03D *25/00*; D21F *7/10*
U.S. Cl. 139—383 A **4 Claims**



1. A hinge element comprised of concatenated warp and filling elements woven in the flat, said elements comprising longitudinally-extending, transversely-spaced groups of closely-spaced warp yarns and two systems of transversely-extending, closely-spaced filling yarns, one system being confined to one group of warp yarns in an arrangement wherein double portions of the filling yarns are longitudinally-spaced by an amount corresponding to the thickness of the double portions

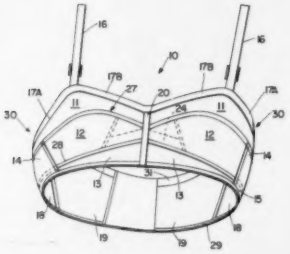
which define a first panel and the other system comprising alternate and intermediate doubled portions which define a second panel, the alternate portions being confined to said other group at a longitudinal spacing corresponding to the thickness of the doubled portions and in transverse alignment with the double portions of the one side and the intermediate doubled portions being located between the alternate doubled portions of the other side and extending across from the other side to the one side between the doubled portions at the one side, said crossing portions connecting the panels, said doubled portions of the yarn, when woven into the warp yarns, being closely-spaced and said filling yarns crossing from one group of warp yarns to the other being longitudinally-spaced apart and supported in spaced relation to each other by the thickness of said double length of filling yarn.

4,144,912

BRASSIERE HAVING INDEPENDENTLY ADJUSTABLE BREAST CUPS

Bernard Pundyk, South Orange, N.J., assignor to Glamorise Foundations, Inc., New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,439
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—484 **15 Claims**



1. In a brassiere having first and second breast cups joined together along a center seam, first and second side panels connected to said first and second breast cups, respectively, and first and second shoulder straps connected to said first and second breast cups, respectively, the improvement wherein each of said breast cups comprises a first front panel, the inner edge of said first front panel being connected to the center seam, a second elastomeric front panel connecting at least a portion of the outer edges of said first front panel to the corresponding side panel, and a rear panel overlapping at least a portion of said first and second front panels, the upper edge of said rear panel being connected to said first and second front panels, the outer edge of said rear panel being connected to the corresponding side panel, and the inner edge of said rear panel being connected to the center seam in spaced relationship thereto by an intermediate elastomeric strap.

4,144,913

HOT MELT ADHESIVE DISPENSING SYSTEM OF THE HAND HELD GUN TYPE

Larry D. Akers; Charles H. Scholl, both of Vermilion; Joseph S. Smith, Euclid, and Edward A. Williams, Elyria, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jan. 26, 1977, Ser. No. 762,530
Int. Cl.[2] B65B *3/10*
U.S. Cl. 141—2 **16 Claims**

5. A system for dispensing a molten fluid thermoplastic adhesive, said system including

a hand held gun

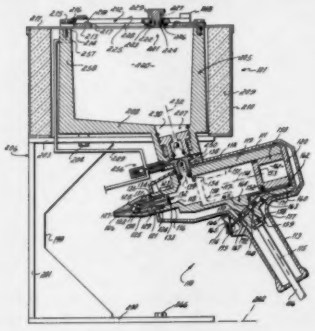
a molten fluid adhesive source located remote and separate from said gun, said gun comprising

a storage chamber adapted to receive a charge of molten fluid adhesive therein,

a charge valve structured to receive molten fluid adhesive therethrough from the exterior of said gun, and to prevent discharge of fluid adhesive therethrough from the interior of said gun,

a nozzle through which the molten fluid adhesive is discharged, and

a discharge valve actuable by an operator for controlling discharge of the molten fluid adhesive from said gun, and said fluid adhesive source comprising



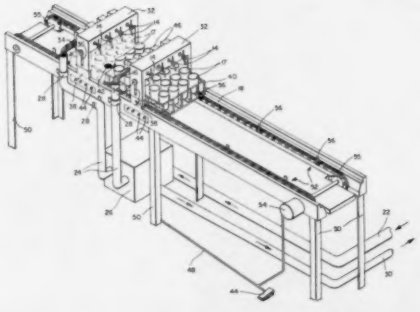
a feed valve mounted to said source, said feed valve being connectable with said gun's one-way charge valve to permit charging of said gun's storage chamber with a molten fluid adhesive charge from said molten fluid adhesive source and then subsequent disconnection of said gun's one-way charge valve from said source mounted feed valve.

4,144,914

METHOD FOR RAPIDLY DISPENSING BEER INTO OPEN CUPS

John W. Nilon, and Thomas J. King, both of Ridley, Pa., assignors to Nilon Bros., Philadelphia, Pa.

Division of Ser. No. 605,435, Aug. 18, 1975, Pat. No. 4,011,896, which is a continuation of Ser. No. 284,103, Aug. 28, 1972, abandoned. This application Mar. 11, 1977, Ser. No. 776,724
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—11 **13 Claims**



1. The method of dispensing beer into successive open cups by cooling the beer to a sufficiently low temperature so as to permit the beer to be dispensed at a rapid rate without a substantial head as compared with the head typically formed at a dispensing temperature above 32° F., said method comprising the following steps:

storing the beer in a vessel;

flowing said beer from said vessel through at least one dispensing line to a dispensing area;

cooling said beer between said vessel and said dispensing area;

moving cups through said dispensing area; and

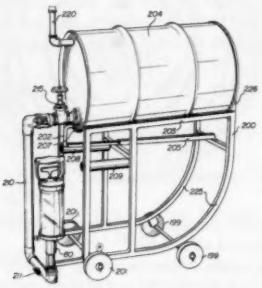
dispensing said cooled beer into said cups at a temperature below 32° F.

4,144,915

LIQUID SUPPLY MEASURING AND DISPENSING APPARATUS

William D. Henderson, deceased, late of Winnipeg, Canada (by Kenneth Milton McLean, executor), assignor to Murray Jack Braunstein, Winnipeg, Canada

Filed Jul. 27, 1977, Ser. No. 819,680
Claims priority, application Canada, Jul. 27, 1976, 257877
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—18 **9 Claims**



1. A liquid measuring and dispensing device which comprises:

a liquid compartment,

a bottom, side and top wall to the liquid compartment,

handle carrying means to said compartment,

a dispensing nozzle below said bottom wall and operatively connected for liquid flow from said compartment through said nozzle,

venting means through the top wall,

a float-insert operatively arranged to close said vent when liquid in said compartment reaches a chosen level,

nozzle operating means adjacent said carrying handle,

shut-off means in said dispening nozzle movable between an open and closed position, means connecting the nozzle operating means to the shut-off means for controlling liquid flow through said nozzle, and

closure means for said vent in said top actuated by said nozzle operating means and adapted to close said vent when said nozzle control is in closed position.

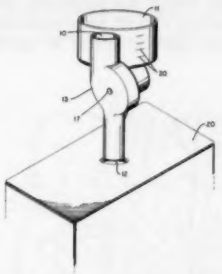
4,144,916

LIQUID METERING FUNNEL APPARATUS

Robert J. Alderman, 812 59th St., NW., Bradenton, Fla. 33505

Filed Sep. 26, 1977, Ser. No. 836,558
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—105 **5 Claims**

1. Apparatus for mixing liquids in predetermined proportions comprising a pair of chambers positioned in side by side relationship, an inlet spout communicating with one side of said first chamber and an outlet spout communicating with the other side of said first chamber, an inlet opening on one side of said second chamber and a drain spout communicating at one of its ends with the other side of said second chamber, said drain spout communicating at the other of its ends with said outlet spout, a flow responsive member in said first chamber and rotatable at an angular velocity corresponding to the volume of liquid moving through said first chamber, a metering member in said second chamber and rotatable in unison with the rotation of said first flow responsive member, a reservoir defining an outlet opening in communication with the inlet opening of said second chamber, whereby the movement of liquid through said first chamber rotates said flow responsive member and said metering member and meters the second



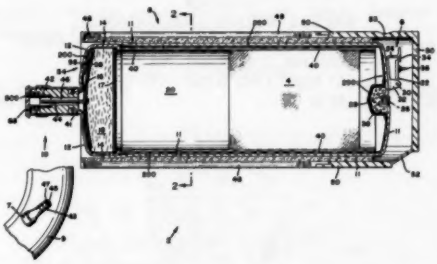
liquid from said reservoir through said second chamber and mixes the first and second liquids in a predetermined ratio.

4,144,917

RESILIENT INSERT FOR TIRE INFLATOR

Robert Millray, Saugus, Calif., assignor to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 757,543, Jan. 7, 1977, Pat. No. 4,062,287, which is a continuation of Ser. No. 554,790, Mar. 3, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,476
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—311 R **6 Claims**



1. A nozzle adapted for connection to the metal threaded part of a tire valve, which comprises:

(a) a well dimensioned to enable said valve to be inserted therein;

(b) an end adapted for attachment to a pressure reservoir;

(c) means for transferring inflating gas from said pressure reservoir to said well; and

(d) a flexible insert mounted in said well, said insert being adapted to connect directly to said metal thread either by mating said insert with the screw thread or by pushing said insert thereon, said insert being adapted to hold said metal thread and to seal said nozzle to said valve during transference of inflating gas from said pressure reservoir to the tire.

4,144,918

TREE HARVESTER AND TRANSPORTER

Charles A. Hallstrom, Eben, Mich. 49825

Filed Sep. 6, 1977, Ser. No. 830,762
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—3 D **13 Claims**

1. A tree harvesting apparatus comprising:

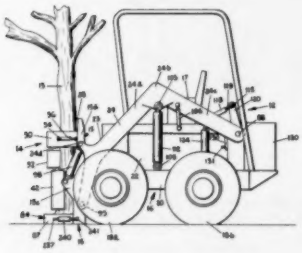
a processing assembly frame including

a gripping means mounted thereon for gripping an upright tree adjacent its base;

shear means mounted thereon below the gripping means for shearing the tree at its base; and

delimbing means mounted thereon for removing branches from the tree;

lifting means for lifting the processing assembly off the ground comprising two lift arms pivotably connected to the processing assembly frame at spaced apart pivot points;



tilting means for tilting the processing assembly frame in a vertical plane from an upright position to a horizontal position; and

sway means for angling the processing assembly frame along a vertical plane substantially transverse to the plane defined by the tilting movement of the processing assembly; the sway means including means for lifting one lift arm with respect to the second lift arm.

4,144,919

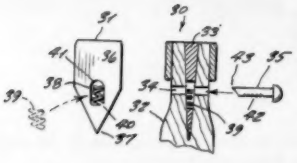
SAFETY WEDGE AND HANDLE

James B. Miller, 426 Polk St., River Rouge, Mich. 48218

Filed Jun. 1, 1978, Ser. No. 911,508

Int. Cl.[2] B25C *1/00*; B25D *1/00*; B25G *1/00*

U.S. Cl. 145—61 R **1 Claim**



1. A wedge and handle assembly for a hand-held tool that includes a head installed upon an end of a handle of said assembly; said assembly also including a wedge fitted in a slot in said end of said handle, and means for preventing said wedge from vibrating loose, and working out of said slot of said handle; said means comprising a slot through said wedge having a compression coil spring in a lower end thereof, a transverse extending opening through said handle and a fastener received through said handle opening and bearing against said spring of said wedge.

4,144,920

TIRE CHAIN CONSTRUCTION

Earl C. Winther, 828 Indian Hills Dr., Moscow, Id. 83843

Filed Sep. 1, 1977, Ser. No. 829,801

Int. Cl.[2] B60C *27/02*

U.S. Cl. 152—233 **1 Claim**

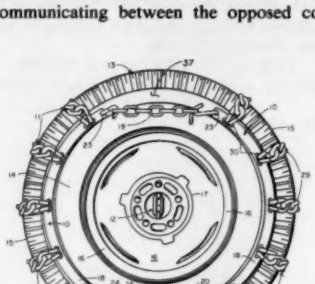
1. A traction device for resilient pneumatic tires that may be installed about the periphery of such tire without moving the tire relative to its supporting surface, comprising, in combination:

elongate, paired opposed side elements each having two similar rigid arcuate elements configured to provide a substantially radially symetrically fit on a tire to be serviced, and two connecting elements, articulatingly interconnecting the rigid arcuate elements,

the two outside connecting elements comprising shorter interconnecting chains and

the two inside connecting elements comprising one shorter interconnecting chain and one compound adjustable rigid connecting bar linkage;

plural spaced chain cross-links extendable across a tire tread and communicating between the opposed cooperating



rigid arcuate elements of each side element to form an interconnected structure;

articulating means interrconnecting the respective ends of each side element and the end of the associated connecting element, at least one of which means carried by the inside side element is releasably fastenable; and

tightening means extending between the medial diametrically opposed portions of the outside chain connecting elements to releasably tighten the traction device about the periphery of a tire carrying it.

4,144,921

PNEUMATIC TIRE WITH AN INTERNAL DAMAGE INDICATOR

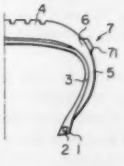
Keiichiro Yabuta; Nagayuki Marumo, both of Yokohama; Yoichi Shimabara, Takatsuki; Masahiro Ishigaki; Ken Ishihara, both of Ibaragi, and Yoshiki Mayama, Nishinomiya, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama and The Toyo Rubber Co., Ltd., Osaka, both of, Japan

Filed Mar. 1, 1977, Ser. No. 773,349

Claims priority, application Japan, Mar. 3, 1976, 51/23520; Apr. 23, 1976, 51/46985

Int. Cl.[2] B60C *19/10*

U.S. Cl. 152—353 R **19 Claims**



2. A pneumatic tire for a motor vehicle comprising:

a carcass;

an elastomeric layer of a first elastomeric material carried on the outer portion of said carcass, said elastomeric layer being formed with a tread portion, two side wall portions and two should portions, each of said shoulder portions merging with said tread portion and one of said two side wall portions; and

means for visually indicating the amount of accumulated fatigue and internal damage of said carcass, said means being affixed to one of said two shoulder portions and out of contact with the surface on which said tire is rolling when said tire is correctly inflated at a first predetermined pressure and to contact said surface upon the pressure in said tire falling a predetermined amount below said first predetermined pressure,

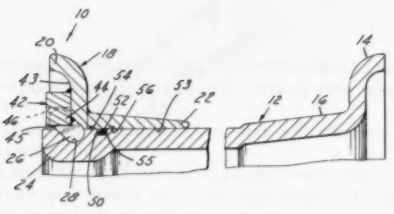
said means being made of at least one elastomeric material which has different abrasion characteristics as compared with said first elastomeric material, said at least one elastomeric material being selected so that the rate of abrasion of said means upon contacting said surface is substantially proportional to the rate at which fatigue and internal damage are accumulated in said carcass when said tire rolls on said surface upon the pressure falling said predetermined amount below said first predetermined pressure, whereby the amount of accumulated fatigue and internal damage is indicated by the amount of abrasion of said means.

4,144,922

WHEEL RIM ASSEMBLY FOR TUBELESS PNEUMATIC TIRES

Don S. Strader, Marietta, Ga., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Jan. 9, 1978, Ser. No. 867,808
Int. Cl.[2] B60C *5/16*
U.S. Cl. 152—410 **9 Claims**



1. In a wheel rim assembly for tubeless pneumatic tires which includes generally cylindrical rim base means, flange means carried at opposed axial ends of said rim base means, at least one of said flange means being axially removable from said rim base means, means for retaining said at least one flange means on said rim base means, circumferential first groove means in an outer surface of said rim base means and annular sealing means disposed in said circumferential first groove means and adapted to cooperate with an inner surface of said at least one flange means to seal a tire mounted on said wheel rim assembly from leakage to atmosphere, the improvement comprising second groove means in said inner surface of said at least one flange means adapted to register with said circumferential first groove means in said outer surface of said rim base means when said flange means is improperly positioned on said rim base means to vent a tire mounted on said wheel rim assembly to atmosphere between said at least one flange means and said rim base means, and thereby to prevent inflation of a tire mounted on said wheel rim assembly when said at least one flange means is improperly positioned on said rim base means.

4,144,923

TIRE TREAD SIPING MACHINE

Kenneth D. Curry, P.O. Box 1856, Hattiesburg, Miss. 39401

Filed Nov. 16, 1977, Ser. No. 851,966
Int. Cl.[2] B29H *21/08*
U.S. Cl. 157—13 **9 Claims**

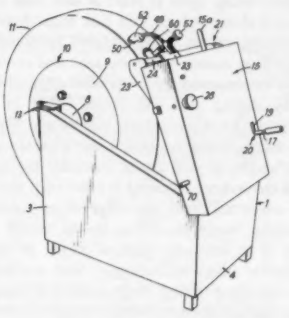
1. A tire tread siping machine which comprises:

(i) a support

(ii) means on said support for supporting a tire in upright position and rotatable about its axis

(iii) a mounting pivotally connected to said support and movable towards and away from said tire support means

(iv) a guide carried in said mounting and adjustable with respect thereto about an axis parallel to the tire axis, and



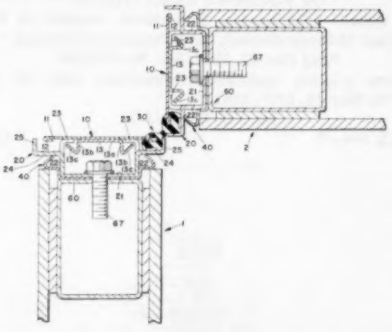
(v) a siping cutter assembly movable along said guide transversely of said support, said assembly including a rotatable siping cutter and a feeler to contact a tread section of the tire.

4,144,924

PANEL CONNECTOR SYSTEM

Harold L. Vanden Hoek, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Mar. 31, 1978, Ser. No. 892,101
Int. Cl.[2] E06B *9/00*
U.S. Cl. 160—231 A **38 Claims**



1. In a panel system in which at least two panels are joined together, with their end edges generally adjacent, by at least one elongated, longitudinally flexible hinge, the improvement comprising:

a removable end cover covering the end edge of each of said panels, said end cover including an inside surface facing said end edge of said panel;

at least two separate first flange means on said inside surface of said end cover, each having at least one end and at least one side edge, one said flange means being located towards the top thereof and one located towards the bottom thereof, each being set off from said inside surface to define a space between each said first flange means and said inside surface, said space being open at least at said end of said flange means and at least along said side edge of said flange means;

second flange means on said end edge of each said panel, one

located towards the top thereof and the other located towards the bottom thereof at a distance corresponding to the distance between said first flange means on said end cover, each said second flange means having at least one end and at least one side edge, and each said second flange means being set off from said end edge to define a space between each said second flange means and said end edge, said space being open at least at said end of said flange means and along at least said side edge thereof:

said first flange means being slidably received behind said second flange means whereby said end cover can be secured to or removed from said end edge of its respective panel by sliding said end cover either in one vertical direction or the other, at least one of said first and second flange means being relatively short as compared to the overall height of said panel whereby the extent of said vertical movement required is relatively slight;

said end cover and said end edge of said panel including cooperating hinge receiving means which open in the vicinity of at least one vertical corner of said end edge; said flexible hinge including a first portion positioned within said cooperating hinge receiving means on one of said panels, and thereby being clamped between said end cover and said end of said panel, said hinge including a second portion clamped within said hinge receiving means of the other of said panels, between its end cover and its end edge.

4,144,925

METHOD AND APPARATUS FOR THE PRODUCTION OF FOUNDRY SAND MOLDS

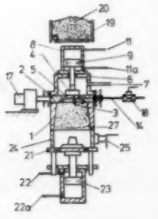
Max Wernli, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Jun. 22, 1977, Ser. No. 809,040

Claims priority, application Switzerland, Jun. 25, 1976, 8151/76; May 18, 1977, 6181/77

Int. Cl.[2] B22C *15/26*

U.S. Cl. 164—7 **3 Claims**



1. A method for producing a foundry mold comprising the steps of placing a dosed amount of mold forming material in a vessel, said vessel being arranged with said mold forming material at a given distance relative to a pattern device from which said mold is to be formed, applying a pressure medium to said mold forming material to exert a force thereagainst on a side of said molding material remote from said pattern device thereby to accelerate said molding material to propel said material against said pattern device to effect compression of said material, with the acceleration of said molding material being braked by striking of said material against said pattern device and partially against a molding box attached with said pattern device, and exerting a vacuum through said mold forming material prior to applying said pressure medium to exert said force thereagainst, said vacuum being exerted through said molding material on the same side thereof where said force is applied, said vacuum creating a suction afterflow through said material thereby to impart a more cohesive composition thereto.

4,144,926

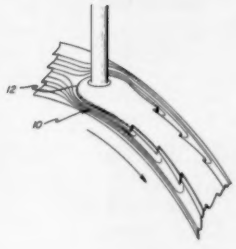
CRITICAL GAS BOUNDARY LAYER REYNOLDS NUMBER FOR ENHANCED PROCESSING OF GLASSY ALLOY RIBBONS

Howard H. Liebermann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,752

Int. Cl.[2] B22D *11/06*

U.S. Cl. 164—87 **2 Claims**



1. A method for producing glassy alloy ribbons including the process steps of

(a) casting a melt of a glassy metal alloy onto a surface wheel having a wheel diameter D;

(b) adjusting the substrate wheel speed S and the melt jet velocity to form a melt puddle of width w on the substrate wheel surface;

(c) adjusting the prevalent ambient atmospheric pressure to a predetermined value;

(d) producing a glassy alloy ribbon from the melt puddle, and

(e) maintaining the Reynolds number Re for the gas boundary layer flow about the melt puddle at less than a critical value Re^{cril} of about 2000 ± 100 whereby the Reynolds number Re is expressed by the following formula:

$$Re = KDSwP\,[\overline{M}/\eta\,]$$

wherein

Re = Reynolds number

K = constant which takes into consideration all conversion factors to obtain dimensional consistency

D = substrate wheel diameter

S = substrate wheel speed

w = ribbon or puddle width

P = ambient atmospheric pressure under which casting is conducted

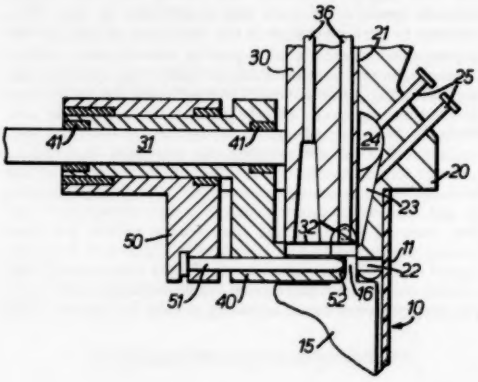
$\overline{M}$ = molecular weight of ambient gas in which casting is conducted

η = viscosity (20° C.) of ambient gas in which casting is conducted

4,144,927
CASTING PLATE STRAPS AND/OR INTERCELL CONNECTORS OF ELECTRIC STORAGE BATTERIES

Barry G. Emerton, North Rocks; William A. Weir, Fairfield, and Thomas F. McLean, Sylvania Heights, all of Australia, assignors to Chloride Batteries Australia Limited, Padstow, Australia

Filed Oct. 6, 1976, Ser. No. 730,250
Claims priority, application Australia, Oct. 7, 1975, 3472/75
Int. Cl.[2] B22D *17/00*
U.S. Cl. 164—108 16 Claims



1. A method of casting a plate strap to interconnect plates of the same polarity of a lead acid storage battery, comprising the steps of:

assembling a group of plates in a stack with the plate lugs aligned in a row;

applying to the lugs a mold having a cavity affording at least an elongated portion to form the plate strap and including slots in the floor through which the plate lugs project, at least that part of the cavity floor between adjacent plate lugs is formed by cylindrical dowels each having a diameter equal to the spacing between adjacent plate lugs;

introducing molten metal into the mold to form an arcuate-shaped plate strap uniting the lugs;

allowing progressive cooling of the plate strap due to the arcuate shape thereof; and

wherein runners for the injection of metal are formed in a portion of the mold which forms a wall of the cavity which is movable generally in its own plane relative to an adjacent wall extending in a direction having a component at right angles to that of the previous wall and further comprising the step of moving said wall and said adjacent wall relative to one another, after making the casting, to shear off the sprue from the casting; and

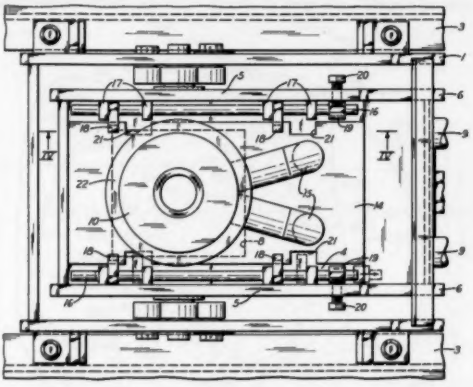
removing the mold.

4,144,928
CONTINUOUS CASTING APPARATUS WITH REMOVABLE MOLD

Joseph Rokop, Bethel Park, and Geoffrey W. Hughes, McMurray, both of Pa., assignors to Rokop Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1978, Ser. No. 892,172
Int. Cl.[2] B22D *11/04*
U.S. Cl. 164—418 5 Claims

1. Continuous casting apparatus comprising a mold table having a substantially horizontal top provided with an opening therethrough, a plate seated on said table top and provided with an opening therethrough above said table opening, a continuous casting mold rigidly mounted on said plate in line with said openings, the table having side walls spaced from two opposite side edges of the plate and extending up above the plate, a shaft extending lengthwise of each side wall between each side wall and the plate, means rotatably connecting



the shafts to the adjoining side walls, a lug rigidly mounted on each shaft and projecting laterally therefrom into overlapping relation with the adjacent marginal portion of the plate, means for turning the shafts to press the lugs down upon the plate to clamp the plate on the table, and means for locking the turned shafts against reverse rotation, release of said locking means permitting said plate to be lifted past the lugs to remove the mold from the table.

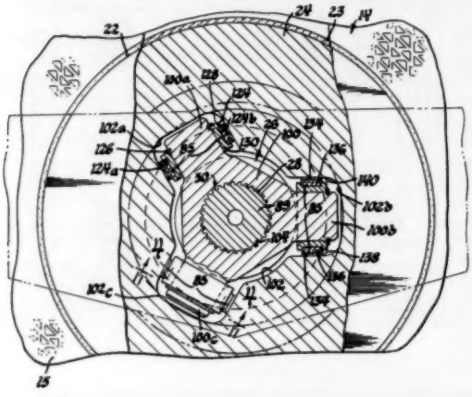
4,144,929
REGENERATOR DISC DRIVE

James M. French, Plainfield, and Samuel R. Thrasher, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1977, Ser. No. 851,171
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—8 2 Claims

1. In a regenerator disc and drive coupling assembly for preventing damage due to sudden load changes or drive discontinuities to a regenerator disc of frangible ceramic material with a central bore directed therethrough, a hub drive assembly including a hub element fixedly secured within said bore, an input drive for rotating said disc and seal means engageable with said disc, the improvement comprising: first fluid damper means connected between the input drive and said hub assembly to isolate the frangible material of the ceramic disc from load imposed shocks produced between the input drive and

said hub assembly, a hub connector element operatively associated with said damper means, said connector element being located interiorly of said hub element and including radially outwardly directed segments thereon located at circumferentially spaced points around said hub element, means forming a coupling recess in surrounding relationship to each of said segments, and a metallic sponge pad supporting received on each of said segments and engageable with the walls of each of said coupling recesses to provide an elastically yieldable thickness of metallic material to accept imposed loads transferred



from said fluid coupling means to the hub assembly and being maintained within its elastic range without permanent set during load imposition thereon so as to be resiliently returnable to its original thickness following acceptance of imposed load transfer from the fluid damper means thereby to further isolate the frangible material of the ceramic disc from load imposed shocks produced between the input drive and said hub, said sponge pad having a spring rate to maintain a resilient bias between said hub connector and said hub element to prevent drive play therebetween.

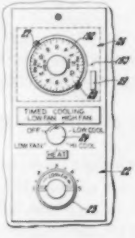
4,144,930

TIMER FOR HEAT-COOL ROOM AIR CONDITIONER

Donald C. Ferdelman, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1977, Ser. No. 842,277
Int. Cl.[2] F24F *1/04*; F25B *19/00*
U.S. Cl. 165—12 **1 Claim**

1. A timed control circuit for a self-contained room air conditioner unit operable to selectively heat or cool air, the combination of a housing enclosing a compressor driven by a motor, a condenser, an evaporator connected in a refrigerant circuit and a fan driven by a multiple speed electric motor for circulating room air to be cooled into heat exchange relation with said evaporator; said fan motor having low and high speed terminals, electric resistance heater means disposed between said fan and said evaporator for heating the circulating air, and in which said housing has a room-side section with a control area thereon; an electric timer located at said control area, said timer including a timer motor and a timer switch having a fixed contact and a movable contact electrically connected in a control circuit, said timer including manually operable time preselector means to preset when said timer switch shall close and open by selecting start and stop times for selectively controlling the cooling time of said unit, said control circuit including first and second supply conductors adapted for connecting the compressor motor and the fan motor to a power source; said timer motor connected between said first and second supply conductors whereby it runs continuously with said unit, a thermostat switch means connected to said first supply conductor and having first and second contacts operative to cycle said compressor on and off in response to the temperature of the circulating cooling air; the improvement wherein a multi-position manual rotary control connected in said control circuit for selectively operating said unit including either a timed cooling mode or an untimed demand heating mode, a single pole-double throw relay connected in said control circuit having first and second fixed contacts and a movable contact, said relay first fixed contact and said timer movable contact connected to a first common terminal, said thermostatic switch first fixed contact connected to said compressor motor which is in turn connected to said first common terminal, said thermostatic switch first fixed contact connected to said compressor which is in turn connected to said first common terminal, said relay second fixed contact connected to said second supply conductor, said multiple selector switch means including at least first, second, third



and fourth selector switches, said thermostatic switch means second fixed contact connected to said first multiple selector switch which is in turn selectively connected to one side of said heater means, said second multiple selector switch selectively connected to said first supply conductor having at least one selective contact connected to said fan motor which is in turn connected to the movable contact of said relay, said third multiple selector switch means having its first and second selective contact means connected to said second supply conductor, said first selector contact means of said third multiple selector switch means connected to one side of operating coil means of said relay and its second selective contact means connected to the other side of said heater means, said fourth multiple selector switch means having its selective contact means connected to said relay first fixed contact and one of its fixed contacts connected to the fixed contact of said timer switch, said timer switch fixed contact connected to said one side of said relay operating coil means and the other side of said relay connected to said first supply conductor, whereby when said rotary control switch is positioned in its heating mode said relay coil is deenergized causing said relay movable contact to contact said relay first fixed contact bypassing said timer switch enabling said fan motor to run continuously, and whereby when said rotary control switch is positioned in its cooling mode said relay coil is energized causing said relay movable contact to be moved into engagement with its second

fixed contact enabling said timer switch contacts to be placed in series with said common terminal causing said unit to operate in its timed cooling mode for a predetermined time in accordance with the start and stop times preselected by said manually operable timer preselector.

4,144,931

SOLAR HEATING AND COOLING COLLECTOR WINDOW

John J. Medico, Jr., 5331 Cape Leyte Dr., Sarasota, Fla. 33581

Filed Aug. 23, 1976, Ser. No. 716,653
Int. Cl.[2] F25B *29/00*; F24J *3/02*
U.S. Cl. 165—48 S **3 Claims**

1. In a solar heating and cooling collector window, a frame, a pair of headers at opposite sides of the frame, a plurality of tubes extending in spaced parallel relation across said window and connected to the headers, a plurality of adjustable solar heat collecting vanes pivotally supported within said frame, means for adjusting the angularity of said vanes in unison, said vanes adapted to distribute solar heat collected by them to said tubes and to water circulating through the tubes, a glass window pane spaced a predetermined distance outwardly of said adjusted vanes, and means for moving said glass window pane upwardly and outwardly from said frame to expose the vanes and tubes to atmospheric temperature for permitting regulation of the temperature of water flowing through the tubes by the atmospheric temperature surrounding the unit.

4,144,932

HEAT SINK FOR ROTATING ELECTRONIC CIRCUITRY

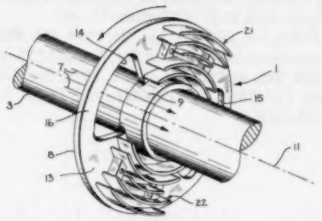
James R. Voigt, Cleveland, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jun. 2, 1977, Ser. No. 802,655
Int. Cl.[2] F28F *13/12, 9/22*; H02K *11/00*
U.S. Cl. 165—80 **8 Claims**

1. In a heat dissipating structure the combination comprising:

a plate member adapted to be mounted for rotation about an axis that is substantially normal to the plate member;

cooling fins on said plate member with the large surface



areas thereof extending axially along and arcuately about said axis; and

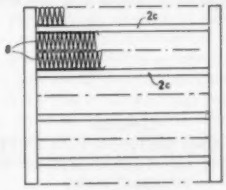
said plate member having at least one opening that is circumferentially aligned with said cooling fins.

4,144,933

HEAT EXCHANGER

George A. A. Asselman, and Adrianus P. J. Castelijns, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 14, 1974, Ser. No. 433,386
Claims priority, application Netherlands, Oct. 31, 1973, 7314929
Int. Cl.[2] F28F *13/12*
U.S. Cl. 165—124 **1 Claim**

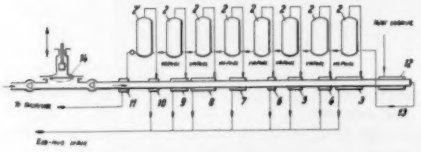


1. A radiator operable with an entering gas flowing in a direction generally normal to a front reference plane, for cooling a quantity of liquid, the radiator formed of at least one heat-transfer element having a generally flat front part and a rear part, which comprises a plurality of pipes for said liquid, the pipes being spaced apart and defining a substantially flat wall, said front part of the element being inclined relative to said direction at an angle $\theta \leqq 45°$; and a multiplicity of fins extending transversely between and connected to said pipes in heat-transfer relationship with air passages defined between each pair of adjacent fins, a typical passage having length $L \leqq 25$ mm. in the direction of flow, hydraulic diameter $d_h \geqq 2$ mm., and the ratio $L/d_h < 25$, the passages having axes that are generally normal to said flat front part; said fins having corresponding entrance and exit parts, said exit parts only of a plurality of the fins being bent to extend generally in said direction of the entering gas flow for directing air exiting said passages, at least one shortened fin intermediate part being arranged between each of the adjacent fins having bent exit parts.

4,144,934
ARRANGEMENT FOR CHANGING THE TEMPERATURE OF FLUIDS WHICH FORM INCRUSTATIONS

Fritz Kämpf, and Hans-Georg Kaltenberg, both of Lünen, Fed. Rep. of Germany, assignors to Vereinigte Aluminium-Werke A.G., Bonn, Fed. Rep. of Germany

Division of Ser. No. 500,123, Apr. 23, 1974, Pat. No. 4,055,218, which is a continuation-in-part of Ser. No. 222,757, Feb. 2, 1972, abandoned. This application Aug. 8, 1977, Ser. No. 822,533
Int. Cl.[2] F28F *19/00;* B01D *1/28;* F28F *13/14*
U.S. Cl. 165—134 R 7 Claims



1. An arrangement for effecting a temperature change of fluids which form incrustations, comprising:

means defining a flow path for a fluid medium;

means for conveying said fluid medium along said path;

first temperature changing means extending for a first distance along said path and adapted to be maintained substantially at a first temperature at which said fluid medium forms incrustations at a first rate; and

second temperature changing means extending for a predetermined second distance along said path and adapted to be maintained substantially at a second temperature at which said fluid medium forms incrustations at a second rate, said first and second distances being in a ratio which substantially equals the ratio of said first and second rates.

4,144,935
APPARATUS AND METHOD FOR IN SITU HEAT PROCESSING OF HYDROCARBONACEOUS FORMATIONS

Jack Bridges, Park Ridge, and Allen Taflove, Chicago, both of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Aug. 29, 1977, Ser. No. 828,621
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—248 70 Claims

1. A system for in situ heat processing of hydrocarbonaceous earth formations, comprising:

a plurality of conductive means inserted in said formations and bounding a particular volume of said formations;

electrical excitation means for establishing alternating electric fields in said volume;

the frequency of said excitation means being selected as a function of the volume dimensions so as to establish substantially non-radiating electric fields which are substantially confined in said volume;

whereby volumetric dielectric heating of the formations will occur to effect approximately uniform heating of said volume.

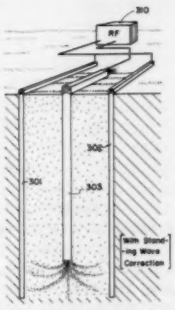
46. A method for in situ heating of hydrocarbonaceous earth formations, comprising the steps of:

forming a plurality of boreholes which bound a particular volume of said formations;

inserting elongated electrical conductors in said boreholes; and

introducing electrical excitation to said formations to establish alternating electric fields in said volume;

the frequency of said excitation being selected as a function



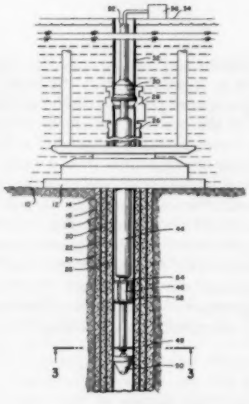
of the volume dimensions so as to establish substantially non-radiating electric fields which are substantially confined in said volume;

whereby volumetric dielectric heating of the formations will occur to effect approximately uniform heating of said volume.

4,144,936
DOWN HOLE MILLING OR GRINDING SYSTEM

Robert F. Evans, La Habra, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 16, 1977, Ser. No. 807,086
Int. Cl.[2] E21B *29/00*
U.S. Cl. 166—298 19 Claims



1. A method of cutting an electrically conductive metal pipe located beneath the earth surface comprising:

suspending an electrically conductive tool within said metal pipe;

applying an electric power source to said tool and said pipe;

circulating an electrolyte adjacent the interior of said pipe in the area to be cut to conduct current between said tool and said pipe to perform electrochemical removal of metal from said pipe; and

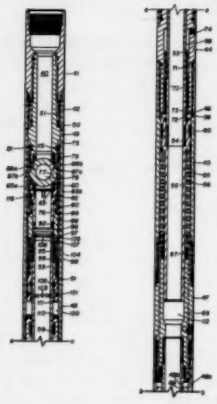
rotating said tool within said pipe while simultaneously moving said tool radially outwardly as the electrochemical removal of metal continues to thereby cut through said pipe.

4,144,937

VALVE CLOSING METHOD AND APPARATUS FOR USE WITH AN OIL WELL VALVE

Gerald D. Jackson, Marlow, Okla.; Jim R. Williamson, Carrollton, Tex., and John C. Zimmerman, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 19, 1977, Ser. No. 861,758
Int. Cl.[2] E21B *43/12, 47/00*
U.S. Cl. 166—314 8 Claims



1. In an apparatus for use in conducting an oil well test wherein the apparatus opens and closes a flow channel in a test string in the oil well extending from the surface to the formation to be tested and includes a valve means for opening and closing the flow channel, opening force supplying means operable from the surface, closing force supplying means for supplying force to close the valve means when the opening force is removed, and valve operating means connecting said opening force supplying means and said closing force supplying means to said valve means for opening and closing said valve means; the improvement comprising:

valve closing means in said valve operating means operable responsive to a pressure differential established by fluid flow through said flow channel past said valve means as said valve means is moving toward the closed position for assisting said closing force supplying means in supplying force to said valve operating means for moving said valve means to the closed position.

5. The method of closing a valve in the flow stream of formation fluid flowing through a tubing string extending from an oil well formation to the surface comprising:

starting to close a valve controlling fluid flow through the tube string responsive to a closing force;

creating a zone of lower pressure on the down stream side of a portion of the valve restricting the flow of the fluid through said tubing string;

transmitting the pressure of the formation fluid on the upstream side of said valve to one side of a piston, and the pressure of said zone to the other side of a piston for creating a force responsive to the differential between said pressures;

assisting the closing force with said created force for continuing to close said valve; and

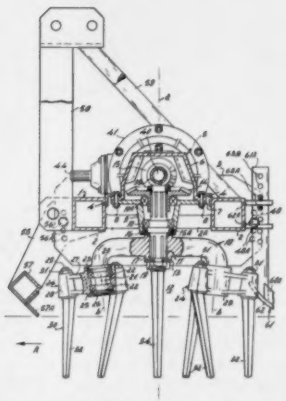
completing the closing of said valve responsive to said assisted closing force.

4,144,938

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed Aug. 23, 1976, Ser. No. 716,767
Claims priority, application Netherlands, Aug. 25, 1975, 7509993
Int. Cl.[2] A01B *33/06*
U.S. Cl. 172—59 9 Claims



1. A soil cultivating implement comprising a frame and a plurality of tined soil working members rotatably supported on said frame side-by-side in a row that extends transverse to the direction of travel, said members being rotatable about corresponding upwardly extending axes and driving means connected to rotate adjacent members in relative opposite directions, at least one soil working member including a rotatable cultivating tool that is freely turnable about a respective further upwardly extending axis during operation and the tools of adjacent members being positioned to work overlapping path regions of soil, soil distribution means on said implement positioned to the rear of said members in substantial register with the overlapping path regions worked by said adjacent members, with respect to the normal direction of implement travel, said distribution means comprising at least one pair of downwardly and then rearwardly curved substantially horizontal, ground surface contacting portions, each pair being mounted for free rotation about an upwardly extending axis, said portions having upwardly extending flange means extending rearwardly and diverging towards rearmost free ends to distribute the worked soil.

4,144,939

APPARATUS FOR CONVERTING CENTRIFUGAL ENERGY INTO PERCUSSIVE ENERGY

Fritz E. Knothe, Quellenturm 4, 5427 Bad Ems, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,541
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609914
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—49 11 Claims

1. Apparatus for converting centrifugal energy into percussive energy comprising a driven rotary shaft, a weighted body rotating with said driven shaft and movable outward radially relative to said driven shaft by centrifugal force resulting from its rotation, a rocking shaft mounted for rocking about an axis parallel to the axis of said driven rotary shaft, a lever mounted on said rocking shaft, a ring carried by said level, spaced from said rocking shaft, having its axis extending parallel to the axes of said rocking shaft and said driven shaft, encircling said weighted body and engageable thereby when said weighted body is being moved radially relative to said driven shaft by

centrifugal force resulting from its rotation for effecting rocking of said rocking shaft, said rocking shaft having a diametral slot therethrough, a bar extending through said slot and having opposite end portions projecting radially beyond opposite sides of said rocking shaft, an anvil located at one side of said

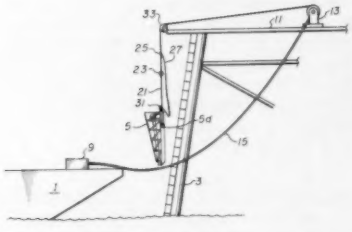
projecting end portions of said bar and engageable thereby, a striker located at the opposite side of said projecting end portions of said bar and engageable thereby, and spring means urging said anvil and said striker toward each other and into engagement with said bar projecting end portions.

4,144,940

METHOD AND APPARATUS FOR INSTALLING AN OFFSHORE PILE DRIVING RIG

Leon D. Ortemond, P.O. Box 53526, Lafayette, La. 70505

Filed Feb. 7, 1977, Ser. No. 765,918
Int. Cl.[2] E21B 7/12
U.S. Cl. 175—5 **16 Claims**



1. In a method for founding an offshore platform for supporting a drill rig thereon by drilling in pile projecting from a submerged surface to a location above the surface of the water body, the method utilizing lifting means, a module crane and a pile driving rig, the improvement comprising:

transporting the lifting means to the deck of the platform and affixing it thereto,

operating the lifting means to dispose the module crane on the deck of the platform,

deploying the module crane on the platform deck,

operating the module crane to dispose the pile driving rig on the platform deck, and erecting the pile driving rig in operative relation to its intended work object,

operating the pile driving rig to accomplish its intended work object,

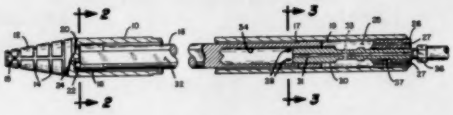
all of the above independently of a barge or drilling rig.

4,144,941

DIRECTIONAL IMPACT TOOL FOR TUNNELING

Lester L. Ritter, 2860 N. Pascal, St. Paul, Minn. 55113

Filed Sep. 30, 1977, Ser. No. 838,239
Int. Cl.[2] E21B 11/02, 7/04
U.S. Cl. 175—19 **8 Claims**



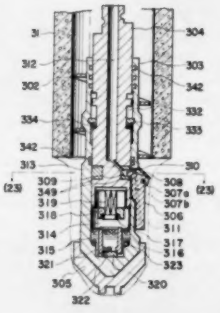
1. In an impact tool for tunneling through the ground by means of a reciprocable hammer which is slidably axially contained within a cylinder having an inner end surface, comprising an anvil having a recession therein in an off-axis position relative to said hammer, and an off-axis mass on said hammer, wherein said off-axis recession in said anvil is complementary-shaped with said hammer off-axis mass and sized to receive said mass.

4,144,942

METHOD OF SETTING A PILE WITHOUT NOISE OR VIBRATION AND APPARATUS THEREFOR

Nobuyuki Abe, Matsudo; Osamu Watanabe, Iwatsuki; Masami Tominaga, Tokyo; Koji Nunokawa; Ichiro Tanaka, both of Kamakura, and Masao Manabe, Kawasaki, all of Japan, assignors to Nippon Concrete Industries Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1977, Ser. No. 815,765
Claims priority, application Japan, Aug. 30, 1976, 51-102565
Int. Cl.[2] E21B 9/26; E02D 7/24
U.S. Cl. 175—286 **5 Claims**



1. An excavating apparatus, in which a screw auger is inserted through the center of a hollow pile and said pile is sunk by its own weight as soil below the bottom of said pile is excavated and the soil is exhausted above the ground, comprising:

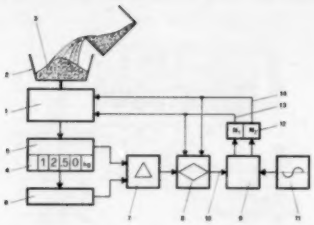
(1) an outer tube including: an auger vane attached on the outer periphery thereof, a plurality of nozzles rotatably attached to said outer tube which can be turned outward, and keys protruding inwardly from the inner surface of said outer tube; and

(2) an inner tube positioned in said outer tube, said inner tube including different diameter portions, alternatively one of said portions engaging with said keys whereby said outer tube rotates when said inner tube rotates, or alternatively another of said portions passing said keys, whereby said inner tube can freely rotate through a certain angle and can freely slide up and down through a certain length within said outer tube; and including grooves into which the top inner ends of said nozzles are confined.

4,144,943
SCALE, IN PARTICULAR FOR WEIGHING BULK GOODS

Mario Gallo, Zurich, Switzerland, assignor to Wirth, Gallo & Co., Zurich, Switzerland

Filed Aug. 30, 1977, Ser. No. 829,047
Claims priority, application Switzerland, Feb. 23, 1977, 002350/77
Int. Cl.[2] G01G 3/14, 19/52
U.S. Cl. 177—210 FP 4 Claims

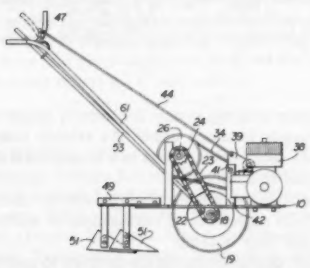


1. A scale for weighing bulk goods comprising
means for measuring the weight of bulk goods,
a digital computing device responsive to said means for measuring and a digital display coupled to said computing device for respectively computing and displaying a weight measurement, said weight measurement being the determined mean weight of said bulk goods over a measuring cycle,
means for determining the difference between two computed weight measurements taken over two consecutive measuring cycles,
means for comparing said difference with a predetermined value and for producing a control signal corresponding to the result of said comparison, and
means responsive to said control signal for controlling the length of said measuring cycle in accordance with the result of the comparison of said difference with said predetermined value.

4,144,944
DRIVE AND STEERING MECHANISM FOR A VEHICLE

George E. Aplin, Sr., Andalusia, Ala., assignor to Fred R. Posey, Jr., Birmingham, Ala., a part interest

Filed Oct. 20, 1977, Ser. No. 843,815
Int. Cl.[2] B62D 11/00, 51/06
U.S. Cl. 180—6.2 1 Claim

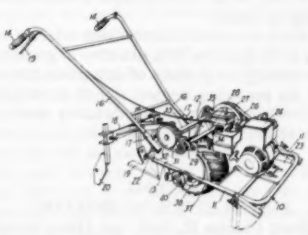


1. In drive and steering mechanism for a vehicle having a frame supported by a pair of transversely spaced ground engaging wheels, the improvement comprising:
(a) a pair of transverse shafts separately connected in driving relation with said wheels and being rotatable about a common axis with adjacent ends of said shafts being adapted for rotation relative to each other and having outer surfaces which are out of round as viewed in transverse cross section,
(b) an elongated sleeve member mounted non-rotatably on said adjacent ends of said shafts with the inner surface of said sleeve member being of a shape corresponding to that of said outer surfaces of said adjacent ends of said shafts and adapted for axial movement relative thereto selectively to a first position in engagement with both of said adjacent ends whereby both shafts rotate as a unit and to a second position in engagement with only one of said adjacent ends whereby said shafts are rotatable relative to each other,
(c) drive means operatively connected to one of said shafts for imparting rotary motion thereto,
(d) an elongated actuator member having one end extending rearwardly of said frame with its other end operatively connected to an annular member carried by said sleeve member with said actuator member being adapted to move said sleeve member selectively to said first position and said second position so that upon movement of said sleeve member to said first position both shafts are driven as a unit and upon movement of said sleeve member to said second position only one said shaft and the wheel operatively connected thereto is driven by said drive means, and
(e) at least one handle extending rearwardly from said frame with the forward end thereof connected to said frame and the rear end thereof being adjacent said one end of said elongated actuator member and in easy reach thereof.

4,144,945
MOTORIZED GARDEN PLOW OR CULTIVATOR

Archie I. Hamilton, Atlanta, Ga., assignor to Hamilton Bros. Mfg. Co., Atlanta, Ga.

Filed Dec. 2, 1977, Ser. No. 856,727
Int. Cl.[2] B62D 51/06
U.S. Cl. 180—19 R 5 Claims



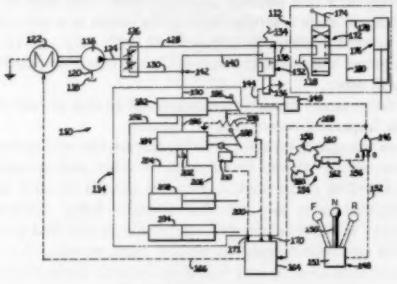
1. A motorized garden cultivator comprising a horizontal U-shaped frame member having rearwardly extending arms, vertical plates rigidly connected to and extending upwardly from the rear portions of said arms for increasing the structural strength of said cultivator frame member, guidance handles extending upwardly and rearwardly from said plates, cultivating tool bar means supported on the rear portions of said arms, a horizontal plate mounted on the forward portion of said U-shaped frame member, an engine mounted on said horizontal plate, bearings rigidly connected to and depending from opposite portions of the arms of said frame member, a shaft rotatably mounted in said bearings, a wheel having a hub portion mounted on said shaft, said wheel extending across more than half the distance between the arms of the frame member, a free wheeling device located within said hub portion and coupled between said wheel and shaft, and a driving connection between said engine and said shaft.

4,144,946

HYDRAULIC PRIORITY CIRCUIT

Grant C. Melocik, Chardon, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jul. 5, 1977, Ser. No. 813,031
Int. Cl.[2] B62D *5/00*
U.S. Cl. 180—132 **15 Claims**



1. A fluid circuit, comprising:

a primary work system, said primary system having first motor means for performing work in response to fluid flow;

a secondary work system, said secondary work system having second motor means for performing work in response to fluid flow;

pump means for providing a flow of fluid for said first motor means and said second motor means;

means for dividing the fluid flow from said pump means into first and second streams;

means for controlling the direction of flow of the first stream, said controlling means being constructed to be operable independently of said primary work system and said secondary work system and to have one position and at least one other position;

means for directing all of the first stream to said primary work system or said secondary work system in response to the position of said controlling means; and

means for delivering the second stream from said dividing means to said secondary work system.

2. A fluid circuit, as set forth in claim **1**, wherein said means for controlling includes:

a vehicle drive-direction selector, said selector being constructed to be movable to a plurality of positions; and

means for sensing the position of said drive-direction selector and for providing control signals in response to the positions of said selector, said directing means being responsive to the control signals.

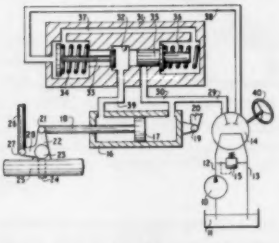
4,144,947

POWER STEERING SYSTEMS

John A. Withers; Charles H. Hull, and Harry Horsfall, all of Huddersfield, England, assignors to David Brown Tractors Limited, England

Filed Nov. 25, 1977, Ser. No. 855,031
Claims priority, application United Kingdom, Dec. 10, 1976, 51610/76; Mar. 25, 1977, 12581/77
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—132 **2 Claims**

1. A power steering system, for a vehicle, comprising a pump circulating oil through a steering-wheel-operated hydrostatic steering unit, a double-acting hydraulic cylinder member connected to said unit by conduit means and containing a piston with a rod member which projects from one end only of the cylinder member, the internal diameter of the cylinder member being $\sqrt{2}$ times the external diameter of the piston-rod member and one of said members being connectible to the frame of the vehicle while the other is operatively connectible to steer the vehicle, and valve means interposed in said conduit means for causing oil displaced from that end of the cylinder member remote from the piston-rod member to return directly to said unit when oil under pressure is supplied to the piston-rod end of the cylinder member, and for causing oil displaced from the piston-rod end of the cylinder member to flow to the other end thereof by way of the valve means when oil under pressure is supplied to said other end, the conduit means comprising a first conduit which connects the hydrostatic steering unit directly to that end of the cylinder member remote from the piston-rod member and communicates by way of a single branch conduit with the valve means, a second conduit which connects said unit to the valve means, and a third conduit which connects the valve means to the piston-rod end of the



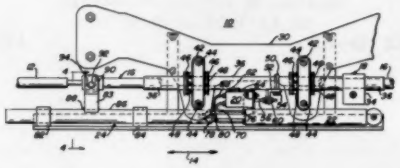
cylinder member, and the valve means comprising a non-return valve for permitting oil flow from the second conduit to the third conduit but not vice versa, and a switching valve urged in the closing direction by resilient means and also by the pressure in a pilot bore permanently communicating with the second conduit for preventing oil flow from the first conduit to the other conduits when oil under pressure is being supplied to the second conduit, and urged in the opening direction against the action of said resilient means by the pressure in the third conduit for permitting oil flow from the third conduit to the first conduit when oil under pressure is being supplied to the first conduit.

4,144,948

POWER STEERING SYSTEM

Dimitry B. Sergay, 427 Dorothy Dr., King of Prussia, Pa. 19406

Filed May 11, 1978, Ser. No. 904,990
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—148 **16 Claims**



1. A power steering system for linearly displacing a tie rod for actuating at least one wheel of a vehicle, comprising:

(a) a rack member extending in a longitudinal direction and coupled to said tie rod;

(b) a rack housing being displaceable in said longitudinal direction responsive to engagement of said rack member and said rack housing;

(c) elastic displacement means coupled to said rack housing and a frame of said vehicle for returning said rack housing to a predetermined position subsequent to said rack housing displacement;

(d) power drive means coupled to said rack housing being actuatably responsive to said rack housing displacement; and,

(e) displacement means coupled to said power drive means

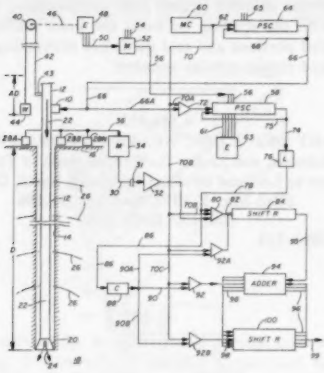
and said tie rod for responsive movement of said tie rod upon actuation of said power means.

4,144,949

BIT POSITIONING WHILE DRILLING SYSTEM

Daniel Silverman, 5969 S. Birmingham St., Tulsa, Okla. 74105

Filed May 2, 1977, Ser. No. 792,565
Int. Cl.[2] G01V *1/36;* E21B *47/02*
U.S. Cl. 181—106 **15 Claims**



1. The method for determining the position in the earth of the bit while drilling at the bottom of a deep bore hole, at a first selected instant of time, comprising the steps of;

(a) in any selected timing, initiating at a source means in the earth at or near the bit, at least a low energy seismic signal, and repeating said initiation at least 100 times, at selectively occurring time intervals;

(b) positioning a plurality of geophones in the earth in known position, in a selected multi-dimensional array, with respect to the expected position of said bit, said geophones adapted to detect and transduce seismic waves in the earth to corresponding electrical received signals, and amplifying and storing said received signals;

(c) at the surface of the earth determining the time of each initiation of said source at said bit;

(d) determining the incremental downward movement of the drill pipe as said bit drills into the earth, starting at the first position of said drill pipe, at said first selected time;

(e) responsive to the determined times of initiation and the incremental downward movement of the drill pipe, stacking each of said received signals from each of said geophones, for each of at least 100 repetitions of said source;

whereby each of the received signals for a given geophone will be added in phase with each of the other received signals from said given geophone, both for the preceding and following repetiions of said source.

4,144,950

TURBINE BEARING LUBRICATION SYSTEM

Thomas D. Moyer, Toledo; Raymond Smith, Monclova, both of Ohio; Aldo J. Urbani, Lambertville, Mich.; Harley D. Greenburg, Monroe, Mich.; Glenn W. Hamburg, Grosse Pointe Park, Mich.; Francis X. Marsh, Maumee, Ohio, and Robert S. Van Huysen, Temperance, Mich., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

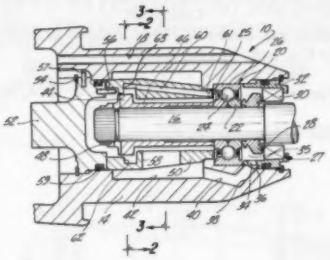
Filed Dec. 22, 1975, Ser. No. 642,687
Int. Cl.[2] F16D *3/46*
U.S. Cl. 184—6.11 **4 Claims**

1. A self-contained lubrication system for a turbine engine, said engine having a support housing and a drive shaft rotatably mounted at a midpoint by a bearing assembly so that a free end of the drive shaft extends into a cavity formed in the interior of the support housing, said lubrication system comprising,

an annular pump impeller secured to the drive shaft adjacent the free end of the drive shaft so that said impeller is axially spaced from the bearing assembly and is contained within the support housing cavity,

an annular lubricant transfer housing secured within the interior of the support housing cavity coaxially around said drive shaft, said transfer housing being spaced radially inwardly from said support housing and spaced radially outwardly from said drive shaft, said transfer housing having a plurality of circumferentially spaced axial passages formed therethrough wherein a first end of each axial passage is open to a first axial end of said bearing assembly closest to said impeller and wherein a second end of each axial passage is open to an interior annular groove in said transfer housing, said annular groove being coaxial with and spaced radially outwardly from said impeller,

said support housing having a plurality of circumferentially



spaced fluid passages for fluidly connecting a second axial end of the bearing assembly most spaced from the impeller to said support housing cavity, said support housing cavity forming a lubricant reservoir,

said transfer housing having a plurality of radial passages formed therethrough between said bearing assembly and said impeller for establishing fluid communication from said reservoir to said pump impeller,

end enclosure means for fluid sealing said support housing cavity at the end adjacent the free end of the drive shaft,

sealing means between said shaft and said support housing at a position axially spaced away from the second end of the bearing assembly,

whereby said lubrication system is completely contained within said support housing between said end enclosure means and said sealing means, and

whereby upon rotation of said drive shaft, said impeller pumps lubricant from said reservoir into said annular groove, through the transfer housing axial passages and through said bearing assembly from its first to its second axial end.

4,144,951

WHEEL CHOCK

Levoy B. Rea, 2209 Lawnmont, No. 106, Austin, Tex. 78756

Filed Jan. 9, 1978, Ser. No. 867,903
Int. Cl.[2] B60T *3/00*
U.S. Cl. 188—32 **8 Claims**

1. A wheel chock comprising

a body including a wheel-engaging surface,

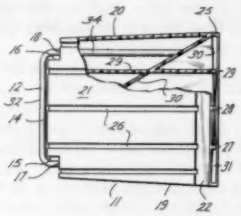
longitudinally extending and laterally spaced bores in said body,

an essentially U-shaped stabilizer bar including a bight and rearwardly extending legs,

said legs adapted to pass through the respective bores into said body,

means in proximity to the end of each of said legs serving as forward limit stops for said bar,

said bar adapted to be at least partially extended in operative condition, said wheel to be positioned on said bar and bear



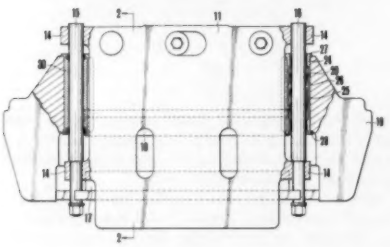
against said wheel-engaging surface to restrain movement thereof.

4,144,952

SLIDING SUPPORT STRUCTURE FOR A DISC BRAKE CALIPER

Tsuneo Nakayama, Iwatsuki, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,767
Claims priority, application Japan, Jul. 6, 1976, 51-89761
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **3 Claims**



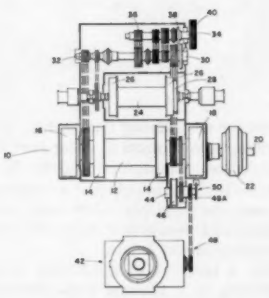
1. A disc brake comprising a rotor to which the brake is to be applied, a caliper member having a thrusting means disposed on one side of said rotor and a reaction member disposed on the other side of said rotor, a pair of friction pads each arranged to be pressed against an opposite side of said rotor by said thrusting means and said reaction member, a support member provided for guiding said caliper member in the axial direction of said rotor, a guide pin connected to one of said caliper member and said support member, an axially elongated opening extending through the other one of said caliper member and support member with said guide pin extending axially through said opening and spaced radially inwardly from the surface of said opening, an axially elongated rigid sleeve secured within and extending through said opening with the opposite ends of said sleeve secured to the other of said members so that said sleeve is held against axial displacement within said opening, said sleeve having an axially extending outer surface in contact with the surface of said opening and an inner surface, said sleeve having an axial length at least equal to the axial length of said opening, said sleeve having an annular groove formed in and extending around the inner surface thereof with said groove having a dimension in the axial direction of said opening less than the axial dimension of the opening and with the opposite sides of the groove spaced apart in the axial direction of said opening each being spaced inwardly from the adjacent end of said opening, said sleeve having a thin-walled portion extending for the axial length of said groove and a pair of thick-walled portions each extending from one side of said groove to at least the adjacent end of said opening, the inner surface of said thick-walled portions being spaced closely outwardly from said guide pin, the axially extending inner surface of said groove forming said thin-walled portion being spaced radially outwardly from the inner surface of said thick-walled portions, an elastic annular member disposed in said groove and extending in the radial direction of said opening between the inner surface of said thin-walled portion and the surface of said guide pin for elastically carrying said caliper member, said annular member extending in the axial direction of said opening between the opposite sides of said groove, and the radial dimension of said groove into the inner surface of said sleeve being sufficient to secure said elastic annular member against axial displacement out of said groove with the spacing between the inner surface of said thick-walled portions and said guide pin preventing total collapse of said elastic annular member.

4,144,953

ROTARY DRIVE DISC BRAKE FOR DRAWWORKS

Earl R. Johnson, and Lesley G. Watkins, both of Tulsa, Okla., assignors to Loffland Brothers Company, Tulsa, Okla.

Filed May 9, 1977, Ser. No. 795,106
Int. Cl.[2] B60T *7/12*
U.S. Cl. 188—134 **4 Claims**



1. In combination with a drawworks operating a drill string during a well bore drilling operation, braking means comprising friction disc means connected with a rotary member of the drawworks for rotation simultaneously therewith, caliper brake means interposed between the drill string and rotary member and disposed in the proximity of the outer periphery of the friction elements for receiving said disc member between the braking element thereof, and means operably connected between the caliper brake means and the drill string for activation of said caliper brake means when reverse torque occurs in the drill string during the well bore drilling operation for precluding the transmission of said reverse torque to the rotary member of the drawworks.

4,144,954

ELECTROMAGNETIC RAIL BRAKE FOR RAILWAY VEHICLES

Luciano Farello; Cesare Prada, and Ettore Restori, all of Turin, Italy, assignors to WABCO Westinghouse, Turin, Italy

Filed Sep. 23, 1977, Ser. No. 836,260
Claims priority, application Italy, Oct. 11, 1976, 69441 A/76
Int. Cl.[2] F16D *65/34;* H02K *49/10*
U.S. Cl. 188—165 **4 Claims**

1. Electromagnetic rail brake apparatus for a railway vehicle and of the type engageable with the running surface of a rail, said brake apparatus comprising:

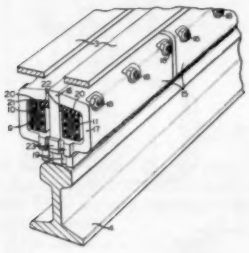
(a) a supporting structure secured to the vehicle; and

(b) a series of brake shoes arranged on said supporting structure in a line corresponding to that of the rail and in such a manner that the individual brake shoes may move freely in relation to the supporting structure, each of said brake shoes comprising:

(i) a ferromagnetic core having pole faces directed toward the rail,

(ii) an excitation coil disposed horizontally in said core so as to have a horizontal median plane of symmetry cutting through the entire peripheral surface of the core and being effective, upon energization thereof, for causing movement of the brake shoes into contact with the running surface of the rail,

(iii) said core having a cross-sectional area substantially in the form of an E with the open side facing downwardly and comprising a horizontal upper part extending over and in vertically spaced-apart parallel relation to the upper surface of the coil to provide a flat space running



the length of the shoe, a central part secured to and extending downwardly from said upper part through a central longitudinal space of the coil to divide said flat space into two parallel portions on opposite sides of the central part and terminating below the lower limits of said coil, and two elongated parallel side parts adjacent respective outer sides of respective elongated arm portions of the coil disposed adjacent opposite sides of the central part, each of said side parts terminating at its lower end with a portion spaced apart from and coinciding with the lower limits of said central part, and

(iv) a shock-absorbing element disposed in said flat space of the brake shoe between said upper part of the core and said upper surface of the coil.

4,144,955

MULTIPLE DISC TORQUE TRANSMISSION DEVICE IN OIL

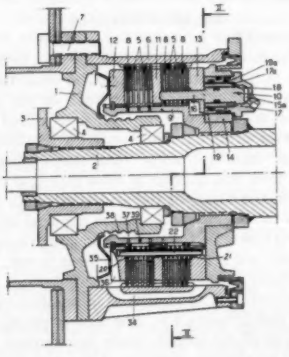
Michel C. Garnier, Brunoy, France, assignor to Etudes et Recherches Avancees, Saint Etienne, France

Filed Nov. 7, 1977, Ser. No. 849,470

Claims priority, application France, Nov. 16, 1976, 76 34451

Int. Cl.[2] F16D *25/063, 13/72*

U.S. Cl. 192—52 **7 Claims**



1. A multiple-disc torque transmission device in oil, of the type comprising a first stack of discs locked in rotation with a first body, a second stack of discs locked in rotation with a second body, the discs of the first stack being inserted between the discs of the second and at least one of the two bodies being free to rotate in relation to the other, and control means for axially moving the discs of both stacks so as to compress them against each other, characterized in that the two stacks of discs form at least two sub-assemblies separated by an axially movable intermediate pressure disc, the first of these sub-assemblies being located between the intermediate pressure disc and a stop integral with one of the two bodies, whereas the second is located between the intermediate pressure disc and an end pressure disc also axially movable, the control means exerting their action in the direction of the stop, at first on the two pressure discs so as to cancel out the clearances between the discs of the first sub-assembly, then on the end pressure disc so as to cancel out the clearances between the discs of the second sub-assembly, and finally on the whole of the discs of both assemblies so as to compress them.

4,144,956

SINGLE LEVER CONTROL UNIT FOR ENGINES

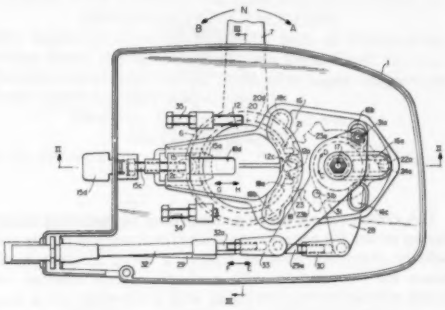
Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable Systems Inc., Hyogo, Japan

Filed Aug. 29, 1977, Ser. No. 828,857

Claims priority, application Japan, Aug. 8, 1977, 52-106311[U]

Int. Cl.[2] G05G *9/08*

U.S. Cl. 192—0.096 **8 Claims**



1. A single lever engine control unit comprising:

(a) a cover member of a casing having locking holes,

(b) a drive shaft rotatably supported by the casing and formed with an axial bore and a cutout groove extending radially from the bore,

(c) a lever having a boss secured to the drive shaft,

(d) a shift rod extending through the boss and slidably inserted in the bore of the drive shaft, the shift rod being biased by a spring in a returning direction and provided with an engaging pin and a retaining pin movable through the cutout groove,

(e) a locking ring turnably supported on the outer periphery of the drive shaft and disposed between the engaging pin and the retaining pin, the locking ring having locking pawls cooperative with the locking holes and engagement means at its outer periphery,

(f) a drive gear rotatably supported by the drive shaft and having a toothed portion on part thereof and a circular outer peripheral surface continuous with the toothed portion, the drive gear being formed with a cavity accommodating the locking ring, a grooved portion in the bottom surface of the cavity for receiving the engaging pin therein and an engaging portion provided axially of the cavity and engageable with the engagement means of the locking ring,

(g) a driven gear rotatably by the drive gear and provided with a toothed portion positioned on part thereof and

meshable with the toothed portion of the drive gear, locking portions disposed on the opposite sides of the toothed portion for contact with the outer peripheral surface of the drive gear, and a pin implanted therein,

(h) a drive plate secured to the drive shaft and having a drive pin implanted therein,

(i) a throttle cam having a cam groove receiving the drive pin therein and mounted on the pin on the driven gear movably in direction at right angles to the drive shaft, the cam groove comprising a circular arc first cam centered about the axis of the drive shaft, and a second cam and a third cam extending from the opposite ends of the first cam respectively in directions away from the center of the first cam and slanting at different angles to the first cam,

(j) a clutch arm turnable by the driven gear and having a clutch cable pivoted to its one end, and

(k) a throttle arm rotatably supported by the pin on the driven gear and having a portion connected to the throttle cam and one end pivotally connected to a throttle cable.

4,144,957

SELF-CENTERING CLUTCH BEARINGS

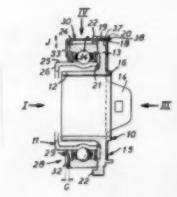
Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Dec. 10, 1976, Ser. No. 749,362

Claims priority, application France, Dec. 30, 1975, 75 40052

Int. Cl.[2] F16D *13/60*

U.S. Cl. 192—98 **22 Claims**



1. A clutch release bearing comprising an operating element having means for cooperation with clutch control means and a radially extending annular flange, a drive element having means for cooperation with a clutch release member, said clutch release bearing having an axis, a one-piece cover member connecting said operating element and said drive element together and for permitting relative radial movement in any direction in a plane perpendicular to said axis for self-centering said drive element, said cover member comprising an axially acting resilient endwall for urging at least a portion of said drive element against said annular flange, and at least two leg portions extending from circumferentially spaced anchoring zones on said endwall radially beyond said drive element and connecting said cover member axially to said operating element, said cover endwall having at least two circumferentially spaced support zones axially offset with respect to said anchoring zones, said endwall bearing against said drive element at said support zones only.

4,144,958

DEVICE TO EFFECT CONTROL OVER THE FRICTION CLUTCH OF A TRANSPORT VEHICLE

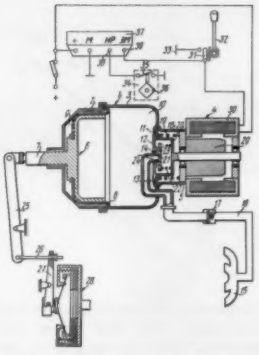
David G. Polyak, ulitsa Smolnaya, 31, kv. 51; Evgeny I. Lebedev, Kronshtadsky bulvar, 29, kv. 34; Jury K. Esenovsky-Lashkov, ulitsa Festivalnaya, 31, kv. 125, all of Moscow; Boris N. Pyatko, prospekt Bogdana Khmelnitskogo, 35, kv. 17, Melitopol, and Vladimir M. Mosyagin, prospekt Lenina, 93, kv. 26, Zaporozhie, all of U.S.S.R.

Filed Aug. 20, 1976, Ser. No. 716,147

Int. Cl.[2] F16D *43/284*

U.S. Cl. 192—105 F **1 Claim**

1. A device to effect control over the friction clutch of a transport vehice having an engine comprising a hollow housing communicating, via a pipeline supplied with a seat, with a pressure source and with the atmophere; a traversable member supplied with a seat, through which a hollow space of said housing communicates with the pressure source and the atmosphere and which is operatively interlinked with a crankshaft of the engine; a spring-actuated valve movable into a position simultaneously in contact with both of said seats; a link accomodated in the hollow space of said housing traversable in response to a pressure variation therein and operatively interconnected with an actuator of said clutch, an electro-magnet for controlling disengagement of said clutch; an operative



association of said traversable member with the engine crankcraft, comprising a crankshaft speed transmitter including a switch having contacts opened and closed during the rotation of a cam of a contact breaker of an ignition system of the engine, a transducer unit to convert the frequency of a signal generated by the opening and closing of the contacts into a current magnitude, the input of said unit being electrically connected to one of the contacts of the switch of said crankshaft speed transmitter and the output being electrically connected to a coil of said electro-magnet; an armature of said electro-magnet being interconnected with said traversable member.

4,144,959

CLUTCH DISK ASSEMBLY

Paul Maucher, Sasbach, and Albert Birk, Bühl-Vimbuch, both of Fed. Rep. of Germany, assignors to LuK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,944

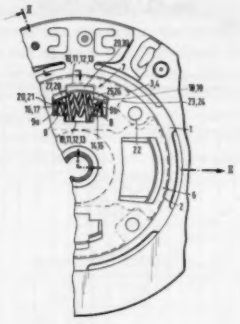
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1976, 2609418

Int. Cl.[2] F16D *3/14*

U.S. Cl. 192—106.2 **5 Claims**

1. In a clutch disk assembly having two structural units formed with window-shaped cutouts, at least two coaxially disposed force-storage devices received in the cutouts and braced against the structural units so as to afford limited torsional play of the structural units relative to one another, one of the structural units including two lateral disks mutually spaced-apart from one another in axial direction of the clutch disk assembly, the other of the structural units including at least one disk-like member disposed in the axial space between the two lateral disks, the two force storage devices comprising a radially inner and a radially outer force storer, the radially inner force storer extending along the length of the radially outer force storer and, as viewed in circumferential direction of the lateral disks, having a portion thereof projecting beyond at least one end of the radially outer force storer, the cutouts being defined by contour portions of the two structural units, the cutout formed in one of the two structural units conforming both to the radially outer force storer as well as to the portion of the radially inner force storer projecting beyond the

end of the radially outer force storer, the contour portions of both structural units extending in the radially inner and outer directions and forming stop contours in both axial and radial



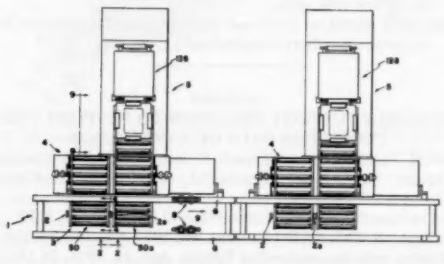
directions in both structural units for the radially outer force storer and in said one of the two structural units for the portion of the radially inner force storer projecting beyond the end of the radially outer force storer.

4,144,960

APPARATUS AND METHODS FOR AUTOMATICALLY TRANSFERRING ARTICLES FROM A CONTINUOUSLY MOVABLE CONVEYOR TO A WORK STATION

George Scourtes, Livonia, Mich., assignor to The Allen Group, Inc., Saginaw, Mich.

Filed Jun. 16, 1977, Ser. No. 807,036
Int. Cl.[2] B65G *13/02*
U.S. Cl. 198—339 18 Claims



1. In material handling apparatus of the kind including a conveyor for conveying articles along a continuous path extending toward, alongside, and beyond a work station located adjacent one side of said conveyor and between the ends of said path, means forming a pathway leading into and out of said work station, and means upstream from said work station for shifting articles off and to said one side of said conveyor, the improvement comprising support means independent of said conveyor and said pathway at said one side of said conveyor for receiving an article shifted off said conveyor and supporting such article in an initial position upstream from said pathway while others of said articles continue to be conveyed along said path; means for transferring such article from said initial position to a second position in register with said pathway; means for moving such article from said second position into said work station via said pathway; means for returning said transferring means to said initial position following movement of such article into said work station, thereby enabling said support means to receive another article from said conveyor while the first-mentioned article is at said work station; and means for returning such first-mentioned article from said work station to said conveyor between the ends of its path.

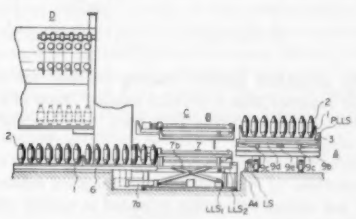
17. A method of transferring articles from a conveyor having a continuous article supporting run extending to, alongside and beyond a work station adjacent said conveyor, and return, said method comprising moving articles on said conveyor in succession along said run; interrupting movement of said articles and moving a first selected article off said conveyor run between the ends of said run; continuing the movement of others of said articles along said run following the movement of said selected article off said run; positioning said first article in register with a pathway extending into said work station; moving said first selected article in a direction leading into said work station via said pathway; interrupting movement of said others of said articles along said run and moving a second selected article off said conveyor run between the ends of the latter and supporting said second selected article in a rest position out of register with said pathway while said first selected article is in said work station; continuing the movement of others of said articles along said run following the movement of said second selected article off said run; moving said first selected article in the opposite direction leading out of said work station via said pathway; moving said second selected article from said rest position into register with said pathway following movement of said first selected article out of said work station; moving said second selected article into said work station via said pathway; and returning said first selected article to said conveyor run between its ends.

4,144,961

METHOD AND APPARATUS FOR TRANSPORTING A GROUP OF YARN PACKAGES

Masao Kasahara; Noriyuki Kouguchi, both of Nishinomiya; Mitugu Inaba, Ibaragi; Masao Kagawa, Suita; Kunio Yamada, Komatsu, and Hiroshi Tanida, Nomi, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,486
Int. Cl.[2] B65G *47/00*
U.S. Cl. 198—472 9 Claims



1. An apparatus for transporting a group of yarn packages between a yarn package forming machine and a subsequent stage of yarn processing, comprising:

a tray for holding a predetermined plurality of yarn packages in such a condition that said yarn packages are kept separate from contacting each other,

a pallet for placing a predetermined plurality of said trays thereon, a transportation carrier for carrying said pallet placed thereon,

a transportation passage connecting said yarn package forming machine to the subsequent stage of yarn processing,

a tray conveyor disposed at the front of said yarn package forming machine along the spindle alignment of said yarn package forming machine in such a condition that the level of said tray conveyor is lower than the level of said spindle alignment of said yarn package forming machine, and

a placing means comprising a lift and a tray-displacing mechanism whereby said trays are moved up and down between the level of the upper surface of said tray conveyor and the level of the upper surface of said pallet placed on said transportation carrier and exchanged between said

tray conveyor and said pallet on said transportation carrier,

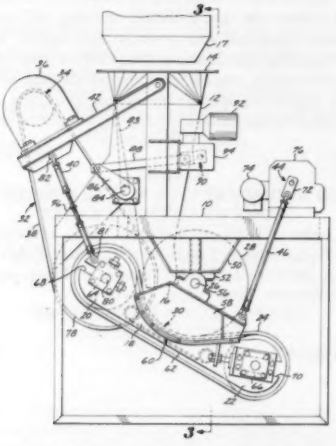
said transportation carrier being disposed beside one of the longitudinal outer ends of said yarn package forming machine so that said placing means is positioned between said one longitudinal outer end of said yarn package forming machine and said transportation carrier.

4,144,962

ADJUSTABLE ATTITUDE LOADING TRIMMER

Allan R. Ide, 10066 Bloomfield, Cypress, Calif. 90630

Filed May 18, 1977, Ser. No. 797,998
Int. Cl.[2] B65G *31/02*
U.S. Cl. 198—641 **4 Claims**



1. An adjustable attitude loading trimmer for dispersing granular material from a vertical loading chute in a substantially horizontal adjustable trajectory, said loading trimmer comprising:

a carriage positioned below said loading chute suspended therefrom by means of a horizontal pivot means;

first and second belt drums mounted in spaced relationship on said carriage;

a belt mounted on said drums for movement thereabout;

a pair of idler wheels mounted in axially spaced relationship on said first axis and in central contact with the edges of said belt between said drums to form said belt into an arcuate path below said loading chute;

drive motor remotely spaced from and drivingly coupled to one of said first and second drums;

an elongated motor platform pivotally connected on one end to said chute and carrying said motor on its opposite extremity;

a connecting rod pivotally connected between said extremity of said platform and said carriage adjacent the driven drum;

a control rod pivotally connected between said chute and carriage at a point opposite to said driven drum;

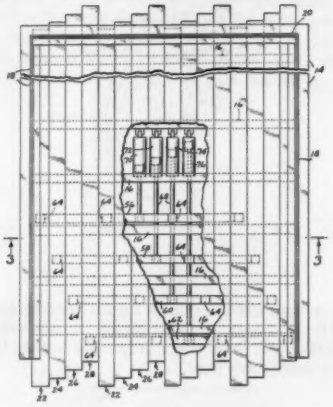
and control means mounted from said chute and coupled with said control rod for pivoting said carriage about said horizontal axis to vary the attitude of said carriage with respect to said loading chute whereby said control means may be actuated to shift said control rod to rotate said carriage about said idler wheels and carry said motor platform therewith.

4,144,963

RECIPROCATING CONVEYOR

Olof A. Hallstrom, 1350 Hallstrom Rd., Tillamook, Oreg. 97141

Filed Aug. 12, 1974, Ser. No. 496,523
Int. Cl.[2] B65G *25/04*
U.S. Cl. 198—750 **16 Claims**



1. A reciprocating conveyor, comprising:

(a) a frame,

(b) a plurality of elongated slat members having longitudinal side walls and spaced apart laterally on the frame,

(c) an elongated flexible sealing strip secured to the longitudinal side wall of one of each adjacent pair of slat members and including a resilient portion extending angularly upward into resilient sliding engagement with the confronting longitudinal side wall of said other adjacent slat member of the pair, and

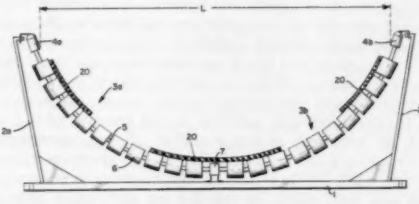
(d) drive means on the frame engaging the slat members for reciprocating them longitudinally.

4,144,964

FLEXIBLE SUPPORT DESIGNED TO SUPPORT THE CONVEYOR BELT OF A CONVEYOR

Florent Valcalda, Louveciennes, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France

Continuation-in-part of Ser. No. 570,991, Apr. 22, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,321
Claims priority, application France, Apr. 22, 1974, 74 14129
Int. Cl.[2] B65G *39/04*
U.S. Cl. 198—830 **19 Claims**



1. A flexible support for supporting a conveyor belt of a conveyor having a frame, comprising at least one individual, flexible and substantially inextensible element extending beneath a portion of the width of the conveyor belt, the at least one individual flexible element being flexible between the ends thereof such that the element is deformable under its own weight into a curve, first means for attaching the at least one individual flexible element at each of its ends to the frame of the conveyor with the length of the at least one individual

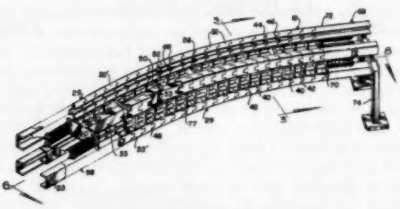
flexible element being greater than the linear distance between the attached ends of the at least one individual flexible element, the at least one individual flexible element delimiting support areas for supporting a portion of the width of the conveyor belt extending at least on opposite sides with respect to the longitudinal median plane of the conveyor, the at least opposite side support areas of the at least one individual flexible element being responsive to the travel of the conveyor belt for being drawn in the travel direction independently of one another, and the at least one individual flexible element being flexible at least in a region extending from an attached end to at least the immediate area of the longitudinal median plane of the conveyor.

4,144,965

FLEXIBLE CONVEYOR TRACK ASSEMBLY

Robert L. Alldredge, 130 Pearl St., Apt. 1108, Denver, Colo. 80203, and Eduard W. VanLingen, 8732 West Fair Dr., Littleton, Colo. 80123, assignors to Robert L. Alldredge, Denver, Colo.

Filed Sep. 12, 1977, Ser. No. 832,575
Int. Cl.[2] B65G *41/00*
U.S. Cl. 198—831 **14 Claims**



1. In a conveyor of the type having a belt adapted to follow a curved path and mounted on rollers, an improved flexible track assembly of the kind having a pair of segmented track portions forming an upper and a lower run for the conveyor, the tracks of each run being horizontally spaced and the runs being vertically spaced with each track of the upper run being approximately vertically aligned with a track of the lower run, the tracks defining an elongated central area running the length of the assembly, wherein the improvement comprises:

(a) a series of pivotally connected links running through said elongated central area for substantially the length of the segmented track portions, each link being joined to a segment of each track and having a length in excess of the length of a track segment to provide controlled bending of a length of each track composed of a plurality of track segments through pivotal bending between links;

(b) means connecting each segment of each upper run track with a segment of the respective vertically aligned lower run track;

(c) resilient guide rods passing through said connecting means between the vertically aligned tracks to laterally support the tracks of the upper and lower runs against relative vertical deflection; and

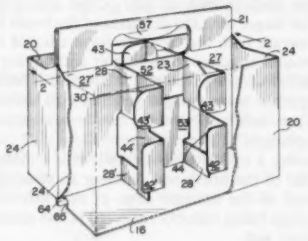
(d) mounting means at the opposite ends of said track assembly for engaging the respective ends of said series of links and for carrying the ends of said guide rods, the guide rod ends passing through said mounting means and having retaining means for fixing the effective length of the guide rods on at least one end of each rod.

4,144,966

ARTICLE CARRIER

Francis V. Kulig, Morris, Ill., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Nov. 21, 1977, Ser. No. 853,224
Int. Cl.[2] B65D *75/00*
U.S. Cl. 206—188 **8 Claims**



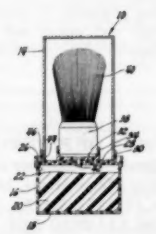
1. A multi-cell article carrier for bottles, or the like, which is formed from a single blank of foldable sheet material and which includes, when erected, a bottom wall, side and end walls upstanding from the bottom wall, said end walls being connected on vertical hinge lines to said sidewalls, a multi-panel, longitudinal partition and handle forming structure upstanding from the bottom wall and having a lower partition forming portion and an upper handle forming portion which multi-panel structure is hingedly connected at opposite ends to the end walls on vertical hinge lines at the center of said end walls and divides the carrier into twin compartments, and cross partition members extending in longitudinally spaced relation at opposite sides of said lower partition forming portion of said multi-panel structure which cross partition members divide each of said compartments into a multiplicity of upwardly opening cells, said cross partition members being hingedly connected to the ends of certain of the panel members in the multi-panel longitudinal partition and handle forming structure and being secured in cross partition forming relation to oppositely disposed sidewalls and portions of said cross partition members being derived from material cut out to form hand accommodating holes in said upper handle forming portion of said longitudinal partition and handle structure and being hinged downwardly from the top edge of said cross partition.

4,144,967

SHAVING KIT

Lawrence C. Craven, 32401 San Bren, Fraser, Mich. 48026, and Frank Sherosky, 29101 Hayes, N-26, Warren, Mich. 48093

Filed Jan. 24, 1978, Ser. No. 871,775
Int. Cl.[2] B65D *69/00*
U.S. Cl. 206—229 **1 Claim**



1. A shaving kit comprising:

a shaving brush having a generally cylindrical handle with a plurality of bristles, said handle having a flat base adapted

to support the bristles in an upright position at such times as the handle is mounted on a planar horizontal surface;

a base member having a chamber for containing a quantity of shaving soap, and a top opening for providing access to the soap by said brush bristles;

a cover having a planar, nonperforated body, said body having a diameter accommodating the top opening of the base member and being disposed therein to form a slidable, water tight engagement therewith;

an annular wall carried on said cover, said wall having a diameter larger than the diameter of the brush handle so as to cooperate with the cover to form a liquid reservoir;

annular means attached to the cover and having a diameter accommodating the diameter of the brush handle and receiving same in an upright position in which the annular means prevents motion of the handle in directions parallel to the plane of the cover;

a cap having a cylindrical sidewall with a diameter larger than that of the brush and defining an opening receiving the brush at the extreme edge of said sidewall, said extreme edge being slidably received in the annular wall on the cover; and

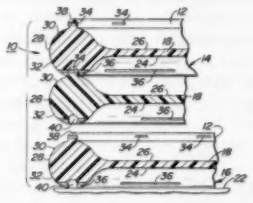
whereby said cover cooperates with the cap to form a water-tight housing for the brush, and cooperates with the base member to form a water-tight chamber for the shaving soap.

4,144,968

DISPOSABLE FOOD TRAY AND CONTAINER SYSTEM

Kenneth Shelton, 327 Candry Ter., Baltimore, Md. 21221

Filed Jun. 26, 1978, Ser. No. 919,138
Int. Cl.[2] B65D *21/02, 51/16, 85/62*
U.S. Cl. 206—509 **16 Claims**



1. A disposable food tray and container system, comprising:

at least a pair of container elements, each of said container elements having a central substantially planar section and a rim element, each of said rim elements extending around said planar section in a closed contour, each of said rim elements having a pair of upper and lower cooperating elements for nesting interface of one of said upper cooperating elements of one of said container elements with said lower cooperating element of a next one of said container elements, each of said upper and lower cooperating elements having at least one aperture formed therethrough, said apertures being alignable for permitting exit of gaseous products when said upper and lower cooperating elements of said pair of container elements are in nesting interface.

4,144,969

BENEFICIATION OF PHOSPHATE ORE

Robert E. Snow, Lakeland, Fla., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Apr. 18, 1977, Ser. No. 788,070
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **13 Claims**

1. A method for beneficiating a phosphate ore having a particle size range of from about 325 mesh (about 44μ) to about 16 mesh (about 991μ), containing substantially discreet particles of apatite and alkaline earth metal carbonate mineral impurity, by a froth flotation process, which comprises:

conditioning the phosphate ore, which contains less than about 20 weight % siliceous minerals and which is an oolitic, sedimentary ore, at a pH of from about 4.5 to about 7.0, in an aqueous conditioning slurry having a solids content of from about 55 weight % to about 75 weight % and containing an apatite-collecting cationic reagent in an amount of from about 0.2 to about 5.0 lb per ton (about 0.1 to about 2.5 g per kg) of phosphate ore and containing a normally liquid hydrocarbon in a weight to weight ratio of hydrocarbon to cationic reagent of from about 2:1 to about 5:1, thereby forming a reagentized phosphate ore; and

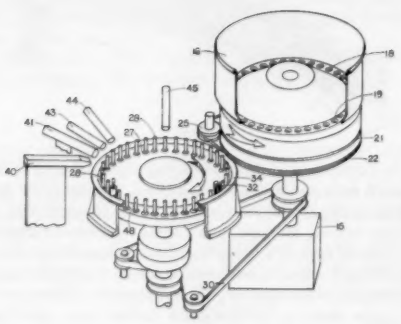
subjecting the reagentized phosphate ore to a froth flotation, wherein a substantially greater amount of the apatite from the phosphate ore is recovered in the froth concentrate and a substantially greater amount of the alkaline earth metal carbonate mineral impurity is rejected in the underflow tailings.

4,144,970

INSPECTION APPARATUS FOR FILLED CAPSULE

Hugh P. McKnight, and Van B. Hostetler, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 10, 1977, Ser. No. 823,296
Int. Cl.[2] B07C *5/16, 5/02*
U.S. Cl. 209—542 **4 Claims**



1. In an apparatus for inspecting the fill content quantity of pharmaceutical capsules in which capsules are individually passed by an inspection station and an ejection station, the improvement of a capsule transfer mechanism comprising: a plurality of vertical chambers for receiving capsules, said chambers being arranged in a circular pattern and connected to a rotary power drive, a rotatable transfer platform having a plurality of vertical hollow receiving tubes connected to a vacuum means, each of said tubes being in axial alignment beneath a respective one of said vertical chambers for at least a part of its rotary cycle, means for regulating the delivery of said capsules onto the free ends of said tubes in an upright position and a plurality of retaining sleeves closely enveloping respective tubes and extending beyond the free ends of said tubes in a first position for receiving said capsules, each of said sleeves having a circumferential shoulder that rests on a stationary camtrack positioned about said transfer platform for lowering said sleeves into a second position to fully expose said filled capsules as they are transported on said tubes by the inspection and ejection stations.

4,144,971
GUN CADDY

Gabriel K. Balibrea, 5020 N. Grand Ave., Covina, Calif. 91722

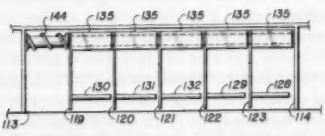
Filed Feb. 27, 1978, Ser. No. 881,589
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—64 3 Claims

1. A portable, earth-engaging gun caddy comprising an elongated irregularly-shaped base member having two regions, one of which assumes a horizontal position when the gun caddy is emplaced, and from which region depend two or more stake members and a brace plate member, used to engage the earth, and the other region, formed to slope upward at its outer extremity, and having upward protruding flanges parallel to the direction of slope, said second region serving as the receptacle for the shoulder stock of the supported weapon; a shaft member rigidly affixed to the base member at or near the end of said base member farthest removed from said sloping region of said base member, said shaft formed and attached so as to tilt away from said sloping region of said base member; and a family of grip members having differing dimensions conforming to the several weapons that may be singly supported by the gun caddy, but each such grip member generally being configured in a U-shape, such that a friction grip will be placed upon the weapon barrel, said grip members being interchangeably mountable upon the upper extremity of said shaft member by keyed-cylindrical means such that rotation about the longitudinal axis of said shaft member is precluded, with the particular grip member selected conforming to the weapon to be supported.

4,144,972
VALET RACK

John A. Wiser, P.O. Box 192, Liberty, Tex. 77575

Division of Ser. No. 589,417, Jun. 23, 1975, Pat. No. 4,027,934.
This application Nov. 8, 1976, Ser. No. 739,739
The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.
Int. Cl.[2] A47B 81/00
U.S. Cl. 211—113 3 Claims

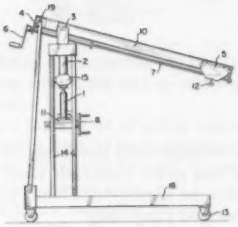


1. A hanger comprising
a body,
a plurality of independent hanger elements, each hanger element comprising a slide member horizontally and slidably mounted in slots above said hanger elements in said body, a back plate attached to said slide member, at least one holding member projecting from said back plate toward an adjacent back plate or wall of said body, said holding member of one hanger element terminating adjacent to a back plate of a juxtaposed hanger element or adjacent wall of said body when said hanging elements are biased together and
spring means for biasing said hanger elements together.

4,144,973
COMBINATION HOIST AND MOUNT

Salvatore Reale, Rte. #1, Box 198, Preston, Md. 21655

Continuation-in-part of Ser. No. 764,967, Feb. 2, 1977, abandoned. This application May 8, 1978, Ser. No. 904,037
Int. Cl.[2] B66C 23/00
U.S. Cl. 212—8 R 1 Claim



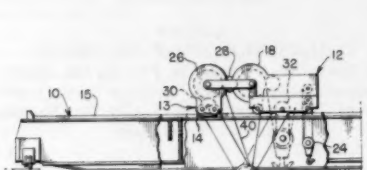
1. A hoisting device comprising:
(a) a framed dolly mounted on castor wheels, said framed dolly having a pair of forwardly projecting legs connected at their rearward ends to a crossbar which extends laterally beyond the point of connection of said legs,
(b) a pair of crossbeams connected to and extending between said legs and intermediate the ends of said legs,
(c) a vertical housing connected to said pair of cross beams,
(d) a rotating mount means rotatably attached to the front of said housing for mounting a portion of the load to be carried,
(e) a horizontal plate attached to the interior portion of said housing between the ends thereof,
(f) a boom
(g) a vertically guided first trolley above said horizontal plate, said first trolley being guided along said housing and having a first pivoted connection to boom above said first trolley,
(h) a pair of links each end pivotally connected to one end of said crossbar and the other end pivotally connected to said boom at a pivot point rearward of said first pivoted connection,
(i) a second trolley supported for movement along said boom and having a load handling hook depending therefrom,
(j) means to move said second trolley along said boom comprising a nut arrangement connected to said second trolley and a screw means connected to said boom to move said trolley by means of a hand operated crank connected to said screw means,
(k) floor lock means connected to the ends of said crossbar for selectively engaging a floor and resisting movement of said device,
(l) jack means for applying a vertical force between said horizontal plate and said first trolley thereby pivoting said boom about said pivot point, said jack means being free of connection to either said horizontal plate or said first trolley and thus being easily removable, and in use in the device, when inserted between said horizontal plate and said trolley, acting only to abut said horizontal plate and said trolley to provide the vertical force there between.

4,144,974

METHOD OF TEMPORARILY INCREASING THE LOAD CAPACITY OF A POWERED DRUM HOIST

Paul L. Longthorpe, Seattle, Wash., assignor to Ederer Incorporated, Seattle, Wash.

Filed May 13, 1976, Ser. No. 686,129
Int. Cl.[2] B66C 17/00
U.S. Cl. 212—18 4 Claims



1. A method of temporarily increasing the load capacity of powered drum hoist which is movable along a horizontal rail, while maintaining the magnitude of lifting travel substantially constant, said method comprising:

mounting a first hoist support on said rail through a pair of spaced apart, rotatably mounted support wheels, said first hoist further including means for selectively urging said first hoist support along said rail in a horizontal direction;

mounting a first cable drum in said first hoist support;

coupling a rotating power unit to said first cable drum for selectively rotating said drum, said power unit being carried by said first hoist support;

mounting a second hoist support on said rail through a pair of rotatably mounted support wheels, said first hoist support being freestanding and separately operable from said second hoist support;

rotatably mounting a second cable drum in said second hoist support, said second cable drum being powered solely by the power unit of said first hoist support,

connecting a removable link between said first and second hoist supports such that said second hoist support moves along said rail with said first hoist support;

suspending a set of traveling sheaves from said first and second drums, said traveling sheaves being rotatably mounted in a load supporting bracket;

securing a first load to said load supporting bracket and selectively raising and lowering said first load by selectively rotating said first and second drums, the weight of said first load being greater than the lifting capacity of said first drum alone;

removing said first load from said load supporting bracket;

detaching said second hoist support from said first hoist support by removing said removable link from said first and second hoist supports;

removing said second hoist support;

suspending the traveling sheaves of said load supporting bracket from said first drum; and

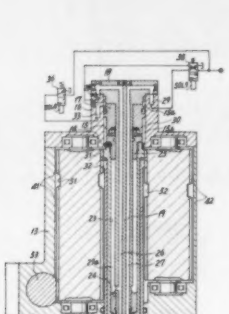
securing a second load to said load supporting bracket, and selectively raising and lowering said second load by selectively rotating said first drum, the weight of said second load being substantially less than the weight of said first load and within the lifting capacity of said first drum alone, and the magnitude of lifting travel for said second load being substantially equal to the magnitude of lifting travel for said first load.

4,144,975

TOOL TRANSFER APPARATUS

Akira Tsuboi, and Tetsuro Yamakage, both of Kariya, Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Jan. 16, 1978, Ser. No. 869,784
Claims priority, application Japan, Jan. 19, 1977, 52-5277
Int. Cl.[2] B23Q 3/157
U.S. Cl. 414—736 3 Claims



1. A tool transfer apparatus in an automatic tool changer for exchanging tools between a machine tool spindle and a tool change station comprising:

a frame;

first and second support shafts coaxially mounted on said frame for rotational and axial movement thereon;

first and second transfer arms superposed with each other and respectively secured to said first and second support shafts, said transfer arms being formed at respective opposite ends with tool gripping portions for gripping said tools;

first and second driven gears formed on said first and second support shafts, respectively;

first and second elongated drive gears engaged with each other and engageable with said first and second diven gears;

means for axially shifting said first and second driven gears between first and second predetermined positions;

said first driven gear being engaged with said first drive gear and said second driven gear being engaged with said second drive gear when positioned at said first predetermined position, said first and second driven gears being engaged with one of said first and second drive gears when positioned at said second predetermined position, and said first and second driven gears being engaged with both of said first and second drive gears during the shifting movement;

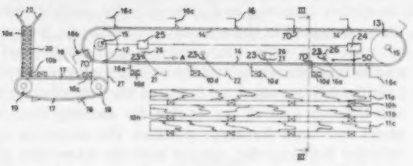
a rack engaged with one of said first and second drive gears; and

drive means connected to said rack for rotating said first and second driven gears at said first predetermined position in opposite directions to thereby simultaneously grip said tools by said gripping portions of said transfer arms and for rotating said first and second driven gears at said second predetermined position in the same direction to thereby replace the mutual position of said tools gripped by said transfer arms.

4,144,976
METHOD AND APPARATUS FOR PROVIDING LUMBER STACKS WITH STICKERS

Alpo Rysti, Frisansintie 22, 02240 Espoo 24, Finland

Filed Sep. 21, 1977, Ser. No. 835,043
Claims priority, application Finland, Jan. 20, 1977, 770192
Int. Cl.[2] B65G 57/26
U.S. Cl. 414—42 14 Claims



1. In a method for placing a plurality of stickers on the uppermost layer of lumber of a lumber stack during formation thereof, the steps of transporting a plurality of said stickers at a predetermined spacing from each other to a predetermined position situated over the uppermost layer of lumber while the stickers are respectively carried by substantially L-shaped support members forming a group of support members which travel horizontally with the stickers supported on horizontal legs of said L-shaped support members which extend forwardly in the direction of travel of the support members from upwardly directed legs of the support members which are situated behind the stickers in the direction of travel of said support members, said direction of travel defining forward and rear surfaces of the stickers, and said horizontal support member legs having free forwardly situated terminal ends, situating respectively behind the stickers when they reach said position over the uppermost layer of lumber a group of removing members for respectively removing the stickers from the group of support members, each of said removing members having a forwardly situated push surface, and, when the stickers have been transported on the group of support members to said position and said removing members are situated behind said stickers, terminating the forward travel of said group of support members whereby the rear surfaces of the stickers and the push surfaces of the respective removing members of said group of removing members are in opposed relationship with each other and reversing the movement of said support members to place the rear surfaces of the stickers in engagement with the respective push surfaces of said removing members and continuing the reverse movement of said support members while maintaining said removing members stationary so that the stickers are pushed by the removing member push surfaces beyond the forward free end of the horizontal legs of the supporting members whereby the stickers are then free to fall downwardly toward the uppermost layer of lumber.

4,144,977
SELECTIVE EDGE OR FLAT SETTING OF BRICK

Hans Lingl, Jr., and Manfred A. Kollmann, both of Paris, Tenn., assignors to Lingl Corporation, Paris, Tenn.

Continuation of Ser. No. 752,917, Dec. 21, 1976, abandoned.
This application Jun. 23, 1978, Ser. No. 918,346
Int. Cl.[2] B65G 57/26
U.S. Cl. 414—57 43 Claims

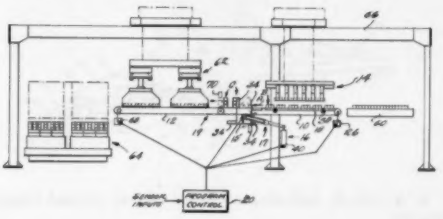
38. A method for grouping and setting bricks during a continuous machine operation, said method comprising:

(a) transferring bricks disposed in a first orientation onto a transport mechanism for movement in a given horizontal direction,

(b) transporting some of said bricks along said horizontal direction while maintaining said first orientation; and transporting others of said bricks along said horizontal direction while changing said bricks to a second orientation tilted by substantially 90° about a horizontal axis with respect to said first orientation, by rotating said others of said bricks 90° about a horizontal axis perpendicular to said horizontal direction of transport,

(c) grouping said bricks of either said first or second orientation into a layer of bricks having like orientation,

(d) temporarily disengaging a portion of said bricks from further movement in said given horizontal direction when selectively changing modes of operation from said first brick orientation to said second brick orientation while said grouping step continues so as to clear bricks from the



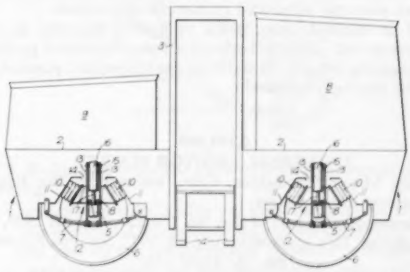
area where tilting can occur thereby facilitating the movement of tilting mechanism into operative position within such area, and

(e) stacking said brick layer of either said first or second orientation into a hack of brick having individual layers therein formed by repeating steps a, b, c and d, the bricks in any given layer having either said first or second orientation as selectively controlled during step b of said continuous operation of grouping and setting.

4,144,978
SUSPENSION SYSTEMS FOR VEHICLES

Ronald Drake, Wrenthorpe, England, assignor to Coventry Climax Limited, Coventry, England

Filed Apr. 11, 1978, Ser. No. 895,525
Int. Cl.[2] B60S 9/12; B60P 7/08
U.S. Cl. 414—544 9 Claims



1. A vehicle having a suspension system for a chassis of the vehicle, the vehicle having at least one axle and a ground engaging wheel at each end of the axle, comprising a suspension unit having:

(1) a sub-frame for each end of the axle; the sub-frame associated with one end of the axle being coupled to the axle by a pivotable connection; the sub-frame associated with the other end of the axle being coupled to the axle by way of a strut whose length can be varied;

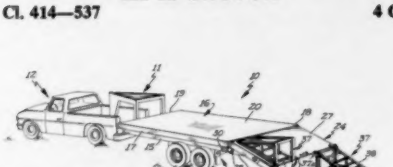
(2) a main suspension spring resiliently coupling each sub-frame to the chassis; and

(3) an elastomeric spring interposed between each sub-frame and the chassis.

4,144,979
BEAVER TAIL PLATFORM ATTACHMENT FOR A TRAILER

Clayton R. Leach, Jr., Fairmont, and Terry L. Munich, Sherburn, both of Minn., assignors to Fairmont Steel Products, Inc., Fairmont, Minn.

Filed Aug. 22, 1977, Ser. No. 826,752
Int. Cl.[2] B65G 67/02
U.S. Cl. 414—537 4 Claims



1. A vehicle including a chassis having ground engaging wheels,

a pair of laterally spaced apart elongate longitudinally extending frame members mounted on said chassis,

a substantially flat bed mounted on said frame members,

a pair of support elements each being mounted on one of said frame members adjacent the rear end thereof and projecting laterally outwardly therefrom,

a substantially flat generally rectangular shaped beaver tail platform having front and rear ends,

a pair of laterally spaced apart support members mounted on the beaver tail platform on opposite sides of the latter and projecting forwardly therefrom, each of said support members having a forwardly opening slot therein, each of said support elements engaging in the slot of one of said support members whereby the beaver tail platform is supported in inclined relation from the bed of the vehicle, each of said support members having an opening therein rearwardly of the associated slot,

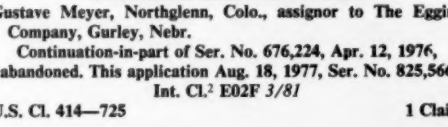
a pair of elongate locking rods each being mounted on one of said frame members adjacent the rear end thereof and extending transversely of said frame members, said locking rods being longitudinally slidable in a transverse direction between locked and released positions, said locking rods extending into the openings in said support members when in the locked position to releasably lock the beaver tail platform in inclined relation on the vehicle,

and an inclined ramp means swingably mounted on the beaver tail platform between a lower operative position engaging the ground and an upper inoperative position on the beaver tail platform.

4,144,980
UNIVERSAL EJECTOR BUCKET

Gustave Meyer, Northglenn, Colo., assignor to The Egging Company, Gurley, Nebr.

Continuation-in-part of Ser. No. 676,224, Apr. 12, 1976, abandoned. This application Aug. 18, 1977, Ser. No. 825,566
Int. Cl.[2] E02F 3/81
U.S. Cl. 414—725 1 Claim



1. An improved ejector bucket of the type having an open front, a substantially flat bottom wall, a top wall narrower than said bottom wall, opposite side walls connecting the bottom and top walls, and a frame-like planar rear wall having substantial sized opening therein, and further including an ejector having a pair of hingedly connected together plates, the first of the plates being an upper plate hingedly connected to the forward edge of said top wall and the second plated being a lower plate slidable along the inner surface of said bottom wall, said plates being moveable into a single plane load pushing position, the bucket being universally adaptable to loader vehicles using quick change attachments, wherein the improvement comprises:

(a) an ejector actuating hydraulic cylinder assembly substantially contained in the area between said top, bottom and opposite side walls, rearwardly of said ejector and substantially forwardly of said frame-like planar rear wall, the cylinder being connected between the rear of the ejector and the top wall of the bucket for moving the ejector plates into load discharge position, the mounting of the cylinder between the ejector and the frame-like planar rear wall allowing the bucket to be mounted on a loader without regard to positioning of structural members peculiar to a specific loader;

(b) said cylinder assembly including a hydraulic cylinder, a piston within the cylinder dividing the cylinder into first and second ends, and a piston rod connected to the piston and extending out the first end of the cylinder, the piston rod having a first tubular passage therein communicating with the first end of the cylinder and having a second tubular passage therein communicating with the second end of the cylinder, said first and second tubular passages having port means near the outer end of the piston rod for connection to hydraulic fluid supply lines;

(c) mounting means on the under surface of said top wall connected to the outer end of said piston rod for providing a relatively stationary mounting location for the hydraulic fluid supply lines;

(d) a trunnion mount on the exterior of said hydraulic cylinder;

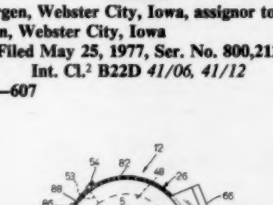
(e) a laterally spaced pair of supports extending rearwardly from said upper ejector plate and adapted to pivotally support said trunnion mount with the cylinder therebetween; and

(f) means independent of the hydraulic cylinder for mounting the bucket on a loader vehicle.

4,144,981
PORTABLE LADLE FOR USE WITH A FORKLIFT TRUCK

Arden L. Borgen, Webster City, Iowa, assignor to Arrow-Acme Corporation, Webster City, Iowa

Filed May 25, 1977, Ser. No. 800,212
Int. Cl.[2] B22D 41/06, 41/12
U.S. Cl. 414—607 9 Claims



1. A portable transfer ladle for use with a forklift truck having spaced apart tines and a power supply source thereon comprising:

a support structure having a pair of spaced apart tine-receiving holes therein and including a pair of spaced apart ladle support members located above said holes and bearing

means on said pair of ladle support members for rotatably supporting a cylindrical ladle;

a cylindrical ladle rotatably mounted on said spaced apart ladle support members of said support structure and rotatable about the longitudinal axis of said cylindrical ladle which is located above and between said spaced apart tine-receiving holes, said cylindrical ladle having a spout on one side and a counter-weight located on the periphery thereof in a position substantially opposite to said spout, said support members mounting said bearing means along the longitudinal axis of said ladle;

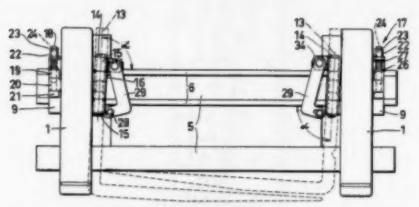
and a ladle drive assembly mounted on said support structure and connected to rotate said cylindrical ladle, said ladle drive assembly including a motor detachably connectable for energization and control from said power supply source.

4,144,982

DEVICE AT FORK-EQUIPPED MACHINE

Gunnar Lundqvist, Skellefteå, Sweden, assignor to AB Holmbom & Hedlund, Sweden

Filed Jun. 4, 1975, Ser. No. 583,524
Int. Cl.[2] B66F *7/28, 9/06*
U.S. Cl. 414—666 **2 Claims**



1. In a fork lift frame supporting a pair of fork legs, each of said fork legs having a substantially vertical portion and a horizontal load supporting portion, the improvement comprising a fork leg assembly for permitting said fork legs to fold aside across the front of said frame while not in use, said assembly including:

fork leg support means movably mounted on said frame;

a pair of hinge means cooperatively disposed on said support means and respectively attached to the vertical leg portion of each of said fork legs for laterally pivoting said fork legs about inclined axes, each of said hinge means including a link pin which defines one of said axes, said hinge means being laterally offset from the vertical leg portions of the fork legs and located between said vertical leg portions such that said axes lie in a plane defined by said vertical leg portions, the axes of said hinge means being inclined at an acute angle relative to the substantially vertical leg portions of the fork legs with which they are associated and in parallel relationship with each other whereby said fork legs may be folded across the front of the truck without hitting one another;

first locking means cooperatively disposed on said support means and each of said fork legs for holding each fork leg in a forwardly projecting load supporting position; and,

second locking means cooperatively disposed on said support means and each of said fork legs for holding each fork leg in said folded position.

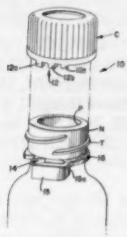
4,144,983

CHILD-RESISTANT CLOSURE

James D. Pauls, and Roy Hammett, both of Miami, Fla., assignors to Lewis, Pauls and Associates, Ltd., Miami, Fla.

Filed Dec. 16, 1977, Ser. No. 861,513
Int. Cl.[2] B65D *55/02, 85/56;* A61J *1/00*
U.S. Cl. 215—216 **27 Claims**

1. A child-resistant closure, comprising: a cap having an end wall and a depending skirt; said skirt having thread means thereon for cooperation with a threaded container to releasably secure the cap to the container; and a plurality of detents integrally formed on the cap skirt for cooperation with a complementary detent on a container with which the cap is associated, to latch the cap against movement in a cap loosening direction; said detents on the cap skirt being spaced circumferentially from one another and each having a different dimension in a direction axially of the skirt, with the leading detent



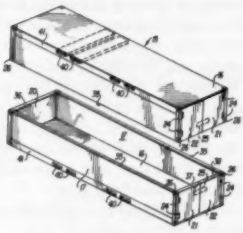
having the greatest axial extent and the trailing detent having the least axial extent, wherein the leading and trailing detents are determined by a cap closing direction of rotation of the cap, whereby full and effective engagement is obtained between any of the detents on the cap with a cooperating detent on a container regardless of which detent on the cap is required to be aligned with a detent on a container for full sealing engagement of the cap with a container by different rotational and axial positions of the cap relative to the container.

4,144,984

SECTIONAL MULTI-PURPOSE CARGO CONTAINER

George D. Saunders, P.O. Box 70026, Ambassador Station, Los Angeles, Calif. 90070

Filed Feb. 23, 1977, Ser. No. 771,113
Int. Cl.[2] B65D *7/00, 87/00*
U.S. Cl. 220—1.5 **5 Claims**



1. A shipping container for intermodal transportation comprising:

a pair of substantially identical parallelepiped-shaped open-top units; each unit comprising parallel opposed longitudinal rectangular walls, parallel opposed rectangular end walls interconnecting said longitudinal walls, and a rectangular load supporting floor member rigidly affixed to said walls, the open top of each unit having substantially identical dimensions as the other and as their respective floor members;

means for connecting said units to each other, said means comprising a locking device in the corners defined by the interconnection of said longitudinal end walls, in the region of said open top;

manipulatable means for engaging said locking devices, whereby when said open tops for these units are positioned in an opposed facing and connecting relation they comprise a parallelepiped-shaped closed container having six rectangular sides without any substantial protrusions extending outward thereof and said manipulatable means

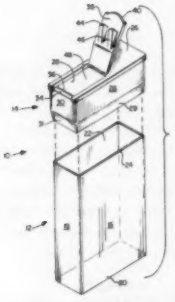
may be manipulated to engaged said locking devices to retain the units one rigidly connected to the other; one of said end walls of each said units comprising hinged access door means, said hinged access door means in each said unit including securing means whereby said units are each adapted to be rigidly secured to an opposed said hinged access door means in the other said unit when said units are originally connected together to form said closed container.

4,144,985

CLOSURE FASTENING MEANS

William G. Kinslow, Kansas City, Mo., assignor to Ethyl Development Corporation, Baton Rouge, La.

Filed May 22, 1978, Ser. No. 908,089
Int. Cl.[2] B65D *51/18*
U.S. Cl. 220—254 **10 Claims**



1. A hollow plastic plug for fitment to the mouth of a container having a substantially rectangular mouth, said plug having:

a. a substantially rectangular cross-section with a long side and a short side;

b. a top wall having an opening extending in the direction of the long side of said plug from the short side thereof;

c. a skirt downwardly depending from said top wall and adapted to obtain said fitment, said skirt having a stepped portion for bearing on the edge of the container mouth upon fitment of said plug to said container;

d. a flap, adapted to close said opening, integrally formed and hinged to the top wall at the end of said opening remote from said short side, said hinge extending along a line perpendicular to said long side;

e. a recess in said plug adapted to receive the free end of said flap in its closed position; and

f. a cooperating snap-action means integral with said plug and having a first portion on the bottom surface of said flap at its free end and a second portion disposed adjacent said recess, said first and second portions having complementary coupling surfaces extending in a direction perpendicular to said long side of said plug, and said second portion having,

i. an inwardly extending horizontal wall,

ii. an inwardly and downwardly directed beveled wall depending from the innermost end of said horizontal wall,

iii. a second horizontal wall inwardly extending and spaced downwardly from the lowermost extent of said beveled wall, and

iv. a vertical connecting wall connecting said lowermost extent of said beveled wall to the innermost extent of said second horizontal wall,

and said first portion having,

v. a downwardly extending vertical wall, said vertical wall having a downward extent approximate the vertical distance between said first and second horizontal walls,

vi. a latch wall outwardly extending from said vertical wall to an extent such that when said vertical wall and said connecting wall are in contact said latch wall extends beneath said second horizontal wall, and

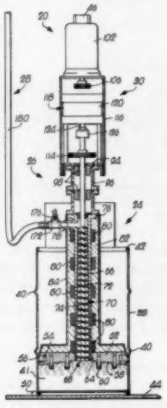
vii. a downwardly and outwardly extending wall connected at one of its ends to said top wall and at its other end to said latch wall.

4,144,986

HOT MELT ADHESIVE PUMPING APPARATUS HAVING PRESSURE-SENSITIVE FEEDBACK CONTROL

Ray V. Smith, 7132 Newton Dr., Overland Park, Mo. 66203; Ray F. Smith, 1104 Mic-o-say, Blue Springs, Mo. 64015; Wesley D. Brizendine, 4314 E. 105th Ter., Kansas City, Mo. 64134, and Robert L. Boatman, 9709 Mohawk La., Leawood, Kans. 66206

Division of Ser. No. 725,540, Sep. 22, 1976, Pat. No. 4,090,640, which is a continuation-in-part of Ser. No. 598,584, Jul. 24, 1975, abandoned. This application Dec. 15, 1977, Ser. No. 860,861
Int. Cl.[2] B67D *5/62, 5/48*
U.S. Cl. 222—52 **4 Claims**



4. Material conveying apparatus, including:

an elongated barrel of tapered configuration having a material inlet and a material outlet;

an elongated, complementally tapered, axially rotatable, axially shiftable auger situated within said barrel for conveying material along the length thereof from said inlet to said outlet;

drive means coupled to said auger for selectively axially rotating the latter in a direction for conveying said material along the length of said barrel to said outlet; and means operatively coupled to said auger for axial shifting of the same during rotation of said auger and relative to said barrel in a direction for increasing the distance between the outer edges of the auger and the adjacent interior wall surface of said barrel.

4,144,987

LIQUID SPRAYER

Takao Kishi, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 692,522, Jun. 3, 1977, abandoned. This application Jul. 5, 1977, Ser. No. 813,051
Claims priority, application Japan, Nov. 7, 1973, 48-125140
Int. Cl.[2] B05B *9/04*
U.S. Cl. 222—321 **4 Claims**

4. A liquid sprayer including a liquid container having a cylinder forming a pressure chamber;

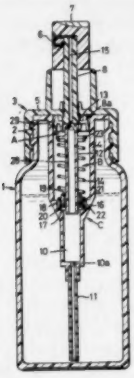
a hollow piston with a liquid passage therethrough and slidably fitted in said pressure chamber so as to have an upstroke and a downstroke reciprocable movement therein;

an actuator having a spray nozzle mounted on said piston for moving said piston through its downstroke so as to pressurize any fluid in said pressure chamber;

a suction tube extending into said liquid container and in communication with said pressure chamber;

a valve rod movable with said piston and located in said pressure chamber and having a valve portion at one end thereof for opening and closing the liquid passage in said piston;

a compression spring urging said valve portion toward said piston for closing said liquid passage therein and for moving said piston through its upstroke;



means on said valve rod responsive to liquid pressure in said pressure chamber so as to open said liquid passage in said piston when the force exerted by said liquid pressure exceeds the force of said compression spring; and

a second valve slidably fitted on said rod and located between said pressure chamber and said suction tube for establishing communication between the pressure chamber and said suction tube in one position and for cutting off communication therebetween in a second position, when liquid from said container is in said pressure chamber, said second valve being moved to its second position whenever and so long as the force on said valve rod exceeds that force of said compression spring so that said passage is closed when said piston is in its downstroke with liquid in said pressure chamber whereby said pressure chamber may be pressurized by said piston through its full downstroke.

4,144,988

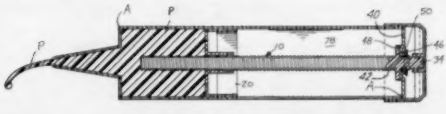
TWIST TOP ACTUATED DISPENSER WITH FOLLOWER

Carl P. Bergman, Lighthouse Point, Fla., assignor to Bridgeport Chemical Corporation, Pompano Beach, Fla.

Continuation-in-part of Ser. No. 683,238, May 4, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,393

Int. Cl.[2] B67O *5/42*

U.S. Cl. 222—390 **6 Claims**



1. For a tube with a dispenser spout at one end of the circular lumen thereof, and an opposite end, a dispenser assembly, comprising:

an annular disk for closing said opposite end of the tube, said disk having a central opening;

a low-pitch lead screw;

a piston of circular outer periphery, said piston having a central bore that is internally threaded and threadably received on the lead screw;

the piston comprising a forwardly presented disk containing said internally threaded central bore, and a coaxially rearwardly extending, tubular peripheral skirt of circular figure;

said skirt having an axially short band of reduced outer diameter disposed where said skirt adjoins said forwardly presented disk;

said lead screw having an axially trailing projection which extends out through said central opening of the annular disk;

means providing a first radially enlarged circumferential boss on the lead screw in extensive face-wise engagement with the inner face of said annular disk peripherally of said central opening;

said first boss being integrally formed with the lead screw;

means providing a second radially enlarged circumferential boss on the lead screw in extensive face-wise engagement with the outer face of said annular disk peripherally of said central opening; and

said second boss being removably secured on the lead screw to permit assembly of the annular disk with the lead screw by being provided by a snap-ring removably received in means defining a radially outwardly opening circumferential groove in said projection; whereby,

when the annular disk is secured to close the trailing end of a tube containing plastic, fluent material, with a dispenser spout at one end of the lumen thereof, with the forward end of the lead screw disposed within the lumen near the dispenser spout, and with the piston received in said circumferentially engaging the interior of the tube, said axially trailing projection may be twisted to advance the piston and thus dispense the plastic, fluent material from the dispenser spout.

4,144,989

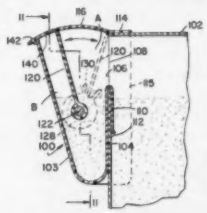
GRANULAR MATERIAL DISPENSER

Walter S. Joy, 12 W. 55th St., New York, N.Y. 10019

Filed Sep. 12, 1977, Ser. No. 832,339

Int. Cl.[2] G01F *71/28*

U.S. Cl. 222—438 **2 Claims**



1. A granular material dispenser comprising a receptacle having a top wall, means for detachably securing said receptacle to a package of granular material, said means including a side wall of said receptacle having a clip portion integral with said side wall and depending therefrom, said side wall having an inlet opening therein, adapted to align with an opening in the package so that said clip portion hooks over said package, an adjustable baffle in said receptable extending from the top of said receptacle toward the bottom thereof, a discharge opening in said top wall of said receptacle, with said baffle being positioned between said inlet opening and said discharge opening, a shaft mounted in said recepacle, the lower end of said baffle being mounted on said shaft so that said baffle is rotatably

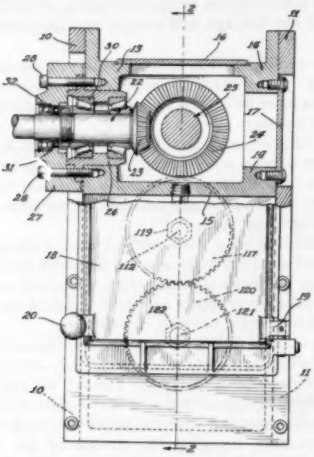
movable in said receptacle, means outwardly of said receptable for positioning said baffle in a selected position, and means for holding said baffle in the selected position, and a lid for closing said discharge opening, said baffle extending to a position immediately adjacent said top wall, said top wall and said lid being arcuate in configuration corresponding to the radius of said baffle.

4,144,990

HIGH SPEED CAM ROLL LIFTER FOR PRESS FEEDER

Kenneth C. Johnson, Des Plaines, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Filed Nov. 14, 1977, Ser. No. 850,971
Int. Cl.[2] B65H *17/22*
U.S. Cl. 226—154 **3 Claims**



1. In roll feeding apparatus, in combination with a pair of rolls including a lower feed roll and an upper idler roll, of frame structure providing journalling means for a horizontally disposed main drive shaft adapted to rotate continuously during operation, a conjugate cam unit fixed on said shaft at one end, a secondary shaft journalled by a tubular member forming part of the frame structure and having the lower feed roll fixed thereon at one end, means connecting the conjugate cam unit with said secondary shaft for driving the secondary shaft intermittently, an actuating cam releasably fixed to the drive shaft at its end opposite the conjugate cam unit, a bracket slidably mounted by the frame structure for vertical adjustment, a pivot arm pivotally carried by the bracket and said arm having the upper idler roll journalled thereon, means operatively connecting the actuating cam with the pivot arm whereby the arm is actuated to lift the upper idler roll in a vertical direction away from the lower feed roll for each revolution of the actuating cam, and an air bag provided by the bracket and positioned so that the end of the pivot arm beyond the idler roll has contact with the air bag, whereby said lifting action of the pivot arm takes place against the pressure exerted by the air bag.

4,144,991

FILM TENSIONING DEVICE

Richard P. Eddy, Gardena, Calif., assignor to Christie Electric Corp., Los Angeles, Calif.

Filed Oct. 11, 1977, Ser. No. 840,815
Int. Cl.[2] B65H *23/08*
U.S. Cl. 226—195 **10 Claims**

1. In a film tensioning device for maintaining tension in the film in a film transport system, the combination of:

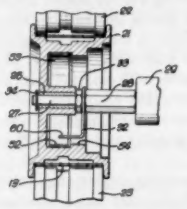
a base;

a tension roller having a periphery for receiving film;

pressure roller means;

means for mounting said tension roller and said pressure roller means on said base with said pressure roller means adjacent said tension roller for urging film against said tension roller periphery;

a stop mounted on said base; and



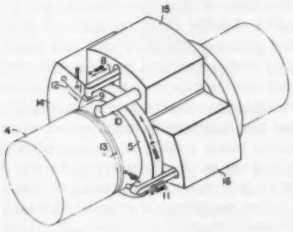
a tension member carried in said tension roller in slidable relation, and engageable with said stop on rotation of said tension roller, independently of the speed of rotation of said tension roller.

4,144,992

METHOD FOR CONTROLLING AN AUTOMATIC PIPE WELDER

Tsutomu Omae; Takanori Shibata; Keiziro Sakai, all of Hitachi; Tomio Iizuka, Ibaraki, and Takaichi Koyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 1, 1977, Ser. No. 829,891
Claims priority, application Japan, Sep. 3, 1976, 51-104872
Int. Cl.[2] B23K *9/10*
U.S. Cl. 228—102 **8 Claims**



1. Method for remotely controlling an automatic welder for butt-welding pipes, comprising the steps of:

(a) storing into a memory, welding conditions in a plurality of regions distributed on a periphery of the pipe;

(b) sensing the position of a welding torch on the periphery of the pipe, reading out the welding conditions stored in said memory at the welding condition modifying points and continuing the welding operation in accordance with the welding conditions read out;

(c) stopping the welding operation after the completion of one revolution of welding and returning the welding torch to an initial point;

(d) actuating a groove shape sensor during the step (c) to sense groove shape; and

(e) positioning said welding torch for effecting welding of the next layer in accordance with the groove shape sensed in the step (d) and repeating above steps in accordance with welding conditions for the next layer stored in the memory thereby effecting multi-layer welding.

4,144,993

METHOD OF PRODUCING A CONTINUOUS CASTING MOLD

Tetsuji Ushio; Satoru Tatsuguchi, and Hoshiro Tani, all of Kitakyushu, Japan, assignors to Mishima Kosan Co., Ltd., Fukuoka, Japan

Filed Dec. 15, 1977, Ser. No. 861,003
Claims priority, application Japan, Sep. 20, 1977, 52-113117
Int. Cl.[2] B22D *9/06, 11/00*
U.S. Cl. 228—107 3 Claims

1. A method of producing continuous casting mold comprising the steps of:

forming an alloy layer consisting mainly of nickel and containing at least one member selected from the group consisting of iron and manganese on a copper or copper alloy mold cavity surface; and

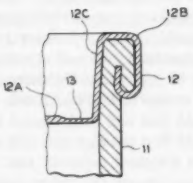
heat-treating the mold.

4,144,994

CLOSURE STRUCTURE FOR CONTAINERS

Robert W. Brickeen, Sr., St. Louis, Mo., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 4, 1978, Ser. No. 930,912
Int. Cl.[2] B65D *3/10, 5/00, 41/32*
U.S. Cl. 229—5.6 5 Claims



1. A closure structure for a composite container of the type consisting of a fibrous body shell with a pair of end closures closing the ends of said body shell, which closures are seamed to the ends of said body shell, one of said closures being specifically designed to facilitate opening thereof by a conventional type cutter both of the type having a toothed driving wheel and of the type having the conventional piercing element, said closure structure comprising:

(a) a flanged structure closing an end of said body shell;

(b) a diaphragm spanning the distance between said flange structure to define a basic closure structure;

(c) the improvements in said closure structure wherein an annular area of greatly reduced thickness is coined adjacent said flange structure in said diaphragm to facilitate entrance of a tool for severing said diaphragm from said flange structure.

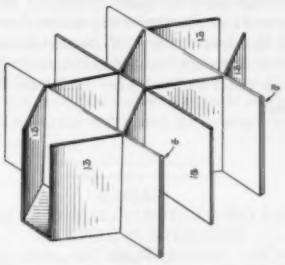
4,144,995

BOX SEPARATOR

Jack R. Travis, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Aug. 29, 1977, Ser. No. 828,734
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—15 10 Claims

1. A separator for dividing a rectangular box into two rows of irregularly shaped compartments comprising a unitary sheet cut to form a folded double thickness central panel, single thickness side panels hingedly connected to each of two opposite sides of said central panel, a single thickness end panel hingedly connected to both of the opposite free sides of each of said side panels, said central panel being generally rectangular and having a center fold line of weakness parallel to its said opposite sides, said side panels being generally trapezoidal with



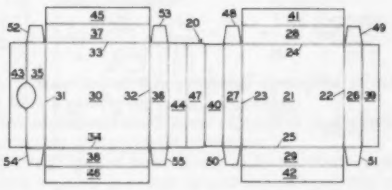
the longer side being the hinged side, and said end panels being generally rectangular.

4,144,996

HINGED CARTON

Morris W. Kuckenbecker, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Dec. 14, 1976, Ser. No. 750,396
Int. Cl.[2] B65D *5/22*
U.S. Cl. 229—33 2 Claims



1. A unitary carton blank for forming a carton having a reclosable cover portion hingedly nestable over a receptacle portion, said blank comprising:

(a) a bottom panel having a front edge, rear edge, and pair of side edges;

(b) a front receptacle wall, rear receptacle wall, and a pair of side receptacle walls hingedly connected to said bottom panel along the front, rear, and side edges respectively of said bottom panel to thereby allow said receptable walls to be folded at their hinged connections to form sidewalls for the receptacle portion of the carton;

(c) a top panel having a front edge, rear edge, and a pair of side edges;

(d) a front cover wall, rear cover wall, and a pair of side cover walls hingedly connected to said top panel along the front, rear, and side edges respectively of said top panel to thereby allow said cover walls to be folded at their hinged connections to form sidewalls for the cover portion of the carton;

(e) a front receptacle flap hingedly connected to said front receptacle wall opposite said bottom panel to thereby allow said front receptacle flap to be folded toward said front receptacle wall to form a double thickness sidewall;

(f) a front cover flap hingedly connected to said front cover wall opposite said top panel to thereby allow said front cover flap to be folded toward said front cover wall to form a double thickness sidewall;

(g) a rear receptacle flap hingedly connected to said rear receptacle wall opposite said bottom panel to thereby allow said rear receptacle flap to be folded toward said rear receptacle wall to form a double thickness sidewall;

(h) a rear cover flap hingedly connected to said rear cover

wall opposite said top panel to thereby allow said rear cover flap to be folded toward said rear cover wall to form a double thickness sidewall; and

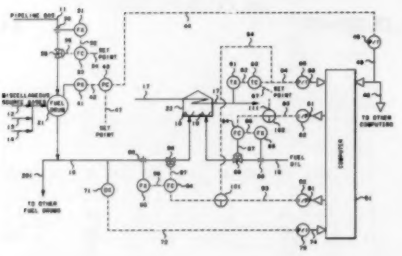
(i) a rear hinge panel hingedly connected along opposed edges to said rear receptacle flap and said rear cover flap whereby the cover portion of the carton can be opened and closed about said hinged connections between said rear hinge panel and said rear receptacle flap and rear cover flap.

4,144,997

CONTROL OF MULTIPLE FUEL STREAMS TO A BURNER

John E. Anderson, and Robert H. Kallenberger, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 12, 1977, Ser. No. 841,510
Int. Cl.[2] F23N *5/02*
U.S. Cl. 236—15 BF **37 Claims**



1. Apparatus comprising

a first burner means;

a second burner means;

first conduit means for supplying a first fuel to said first burner means;

second conduit means for supplying a second fuel to said second burner means;

means for establishing a first signal representative of the total heat duty which must be supplied by said first and second burner means;

means for establishing a second signal representative of the heat duty which can be supplied by said first fuel;

means for establishing a third signal representative of the heat of combustion of said first fuel;

means for dividing said second signal by said third signal to produce a fourth signal representative of the flow rate of said first fuel necessary to provide the heat duty which is to be supplied by said first fuel;

means for manipulating the flow rate of said first fuel to said first burner means in response to said fourth signal;

means for subtracting said second signal from said first signal to produce a fifth signal representative of the heat duty which must be supplied by said second fuel;

means for establishing a sixth signal representative of the heat of combustion of said second fuel;

means for dividing said fifth signal by said sixth signal to produce a seventh signal representative of the flow rate of said second fuel necessary to provide the heat duty required of said second fuel; and

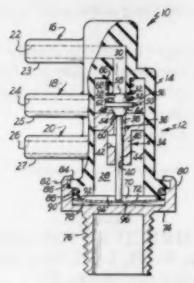
means for manipulating the flow rate of said second fuel to said second burner means in response to said seventh signal.

4,144,998

DOUBLE THROW THERMAL VALVE

Makoto Wakabayashi, Norton, and John Doherty, Jr., Assonet, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 530,800, Dec. 9, 1974, abandoned. This application Mar. 30, 1977, Ser. No. 785,010
Int. Cl.[2] G05D *23/10*
U.S. Cl. 236—48 R **8 Claims**



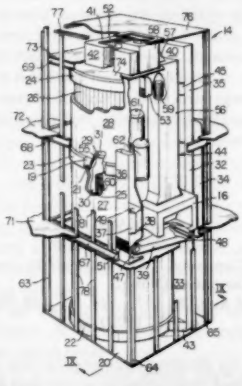
1. A thermally responsive valve assembly comprising a valve body, said body having a first and a second passage therein, two valve seats disposed in said body, the first positioned in said first passage and the second positioned in said second passage, and valve means including a bimetallic member seat formed in said body, a dish shaped snap acting thermostatic bimetallic member disposed at said seat, the member snaps in response to temperature change and simultaneously causes said valve means to likewise move into and out of engagement with said first and said second seats thereby selectively blocking said first passage and said second passage and first spring means disposed adjacent said bimetallic member biasing said member toward the valve seats.

4,144,999

SYSTEM AND STRUCTURE FOR CONDITIONING AIR

William H. Zebuhr, Nashua, N.H., assignor to Sunhouse, Incorporated, Nashua, N.H.

Filed Nov. 16, 1976, Ser. No. 742,346
Int. Cl.[2] F24J *3/02*
U.S. Cl. 237—1 A **13 Claims**



1. The combination comprising: a hollow upright tank adapted to contain water; a heat insulative barrier dividing the tank into an upper tank section and a lower tank section; an intermediate circumferential hollow duct encompassing the tank in the general area of the barrier; an upper circumferential

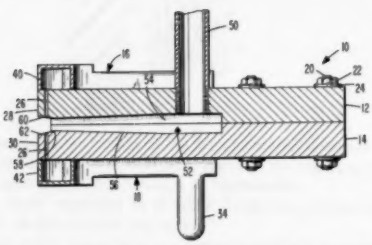
hollow duct encompassing the upper tank section and located spacedly from and upwardly of the intermediate circumferential duct; a lower circumferential hollow duct encompassing the lower tank section and located spacedly from and downwardly of the intermediate circumferential duct; an upper enclosure of heat insulative material, encompassing the upper tank section and spaced therefrom between the intermediate and upper circumferential ducts, defining an upper air channel that is in communication with the intermediate and upper circumferential ducts; a lower enclosure of heat insulative material, encompassing the lower tank section and spaced therefrom between the intermediate and lower circumferential ducts, defining a lower air channel that is in communication with the intermediate and lower circumferential ducts; a duct system in communication with all of the circumferential ducts so constituted as to provide air communication from the exterior space outside of the tank; force applying means for forcing air through the duct system, the circumferential ducts and the air channels; and selector means so adjusting the force applying means and/or the duct system as to selectively force the air from said space through a selected circumferential duct, then through a selected air channel, and then through a different selected circumferential duct back to said space, the flow of the air through the selected air channel enabling a heat transfer to take place between the water in the tank section encompassed by the selected air channel and the air flowing through the selected air channel.

4,145,000

SNOW-MAKING NOZZLE ASSEMBLY

Fergus S. Smith, P.O. Box 57, South Londonderry, Vt. 05155, and David I. Arch, P.O. Box 487, Pocassett, Mass. 02559

Filed Jan. 14, 1977, Ser. No. 759,300
Int. Cl.[2] F25C *3/04*
U.S. Cl. 239—14 **10 Claims**



1. A snow-making nozzle assembly for use in atomizing water and projecting the atomized water by compressed air into atmosphere having an ambient temperature below about 32° F. to form snow, said nozzle assembly comprising:

upper and lower body plates, each said plate having a grouping of plural spaced water outlet ports passing through a peripheral portion of each said plate with each said port in said upper plate positioned substantially directly above and in opposition to a corresponding one of said ports in said lower plate, said corresponding ones of said ports in said upper and lower plates having corresponding axes which are substantially perpendicular to said plates;

upper and lower water distribution headers carried by said upper and lower plates, said headers terminating in distribution chambers overlying corresponding groupings of water ports for supplying water under pressure to said water ports;

a converging-diverging nozzle in said plates, said nozzles extending outwardly from an inlet at an interior portion of said plates to an outlet at said peripheral portion of said plates, said outlet portion of said nozzle providing a space between said groups of ports in said upper and lower plates, said groups of ports being positioned in said plates at the diverging portion of said converging-diverging nozzle;

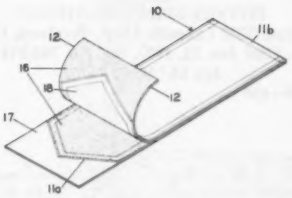
means for supplying water under pressure to said upper header and said lower header for passage through said ports in separate streams each of which impinges on a corresponding stream from an opposed port for atomization midway in said space between said plates whereby said air under pressure in passing out through said nozzle contacts said atomized water to atomize it further and to carry said atomized water into the atmosphere for formation of snow.

4,145,001

PACKAGING FOR CONTROLLED RELEASE OF VOLATILE SUBSTANCES

Robert J. Weyenberg, and Don W. Seidler, both of Appleton, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Sep. 15, 1977, Ser. No. 833,500
Int. Cl.[2] A61L *9/04*
U.S. Cl. 239—56 **26 Claims**



1. A package selectively providing controlled release of vapors from a volatile substance, comprising:

(a) first and second outer layers of material impermeable to the vapors of the volatile substance;

(b) first and second inner layers of thermoplastic material sealed together in a bond formed around a quantity of the volatile substance, the first of said layers being permeable to the vapors of the volatile substance and the second of said layers being adhered to one of said outer layers;

(c) a release layer adhered to said permeable inner layer and to the other of said outer layers, the adhesion of said release layer to said permeable layer being less than the adhesion of the bond between said inner layers, less than the adhesion between said release layer and said outer layer adhered thereto, and less than the adhesion between said second inner layer and said outer layer adhered thereto, and wherein the cohesion of said permeable layer at the bond is less than its adhesion to said second inner layer, whereby when a user pulls the package apart by pulling apart the portions of the package where said inner layers are not bonded, said permeable layer will pull apart at the bond and will remain adhered to said second inner layer and will delaminate from said release layer, such that the volatile substance will be covered only by said permeable layer to allow the diffusion of vapors from the volatile substance therethrough at a selected controlled rate over a period of time.

14. A process for producing a package which provides selective controlled release of vapors from a volatile substance, comprising the steps of:

(a) laminating together a release layer and a permeable inner layer at a selected adhesive strength between the two layers, said permeable layer being formed of a thermoplastic material which is permeable to the vapors of the volatile substance;

(b) laminating the release layer side of the release layer-permeable layer laminate to a first outer layer to form a first laminated panel, the outer layer being formed of a material which is impermeable to the vapors of the volatile substance, the adhesion between the release layer and

the impermeable layer being greater than the adhesion between the release layer and the permeable layer;

(c) laminating a second inner thermoplastic layer onto a second impermeable layer to form a second laminated panel, the adhesion between the second inner layer and the second impermeable layer being greater than the adhesion between the permeable layer and the release layer of the first panel;

(d) placing the first and second panels together over a quantity of the volatile substance with the permeable layer and the second inner layer in facing relation;

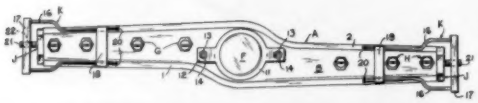
(e) forming a heat bond between the first and second panels with the bond surrounding the quantity of volatile substance, the heat bond being formed such that the adhesion of the release layer to the permeable layer is less than the adhesion of the bond between the permeable layer and the second inner layer, less than the adhesion between the release layer and the impermeable layer adhered thereto, and less than the adhesion between the second inner layer and the impermeable layer which is adhered thereto.

4,145,002

ROTARY SPRAY MANIFOLD

Tore H. Noren, 3200 Lakeville Hwy., Petaluma, Calif. 94952

Filed Jan. 31, 1977, Ser. No. 763,814
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—110 **4 Claims**



1. A spray manifold having at least one hollow elongated arm with an open outer end:

(a) a cleanout gap adapted to close the open end of said arm;

(b) a frame supporting said cap and being pivotally connected to said arm so as to swing said cap from closed to open position for permitting the cleaning of the interior of the hollow arm;

(c) said frame including a pair of spaced apart and substantially parallel rods that straddle the sides of said elongated arm, the inner ends of said rods being pivotally connected to said arm and the outer ends having a cross strap interconnecting them;

(d) means adjustably connecting said cleanout cap to said strap for permitting the cap to be moved into and out of contact with the open end of said elongated arm when said frame has swung its strap into spaced registration with the open end; and

(e) a cross member extending between said arms and connected thereto, said cross member contacting said arm when said frame has swung said strap into spaced registration with the open end of said arm.

4,145,003

GUARD FOR POP-UP SPRINKLER

Richard J. Harrison, Delray Beach; William G. Muschett, Miami, and Charles T. Hardy, Wilton Manors, all of Fla., assignors to Safe-T-Lawn, Inc., Hialeah, Fla.

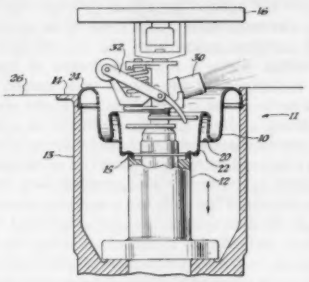
Filed Aug. 26, 1977, Ser. No. 828,250
Int. Cl.[2] B05B *1/28, 15/10*
U.S. Cl. 239—288 **3 Claims**

1. A guard in a piston type pop-up sprinkler having a pop-up head slidable in a piston guide and an outer casing having an upper rim comprising;

a flexible water resistant piece of material having a memory of a movable molded shape, said shape having a plurality of predetermined folds, said material having an outer perimeter and a central perimeter,

a first means for connecting said outer perimeter to the upper portion of said outer casing of said piston type pop-up sprinkler,

a second means for connecting said center perimeter guard to the slidable piston portion of said movable pop-up head in said pop-up sprinkler,



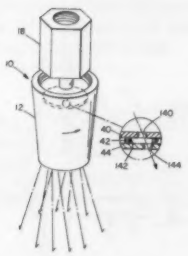
said guard shaped by said memory to provide a flexible dam portion above said upper rim when said pop-up head is in the upper position to deflect ground water and a plurality of predetermined folds lower than said dam.

4,145,004

SHOWERHEADS

Jan G. Krizik, Wellesley, Mass., assignor to IDR Enterprises, Inc., Needham, Mass.

Filed Oct. 13, 1977, Ser. No. 841,829
Int. Cl.[2] B05B *1/18, 1/26;* F16K *5/06*
U.S. Cl. 239—499 **8 Claims**



1. In a showerhead comprising a body having an inlet end adapted to be connected to a source of liquid under pressure, a liquid outlet end spaced from said inlet end, and a bore defining a passage extending between said inlet and outlet ends, that improvement comprising:

a pair of discs disposed in said passage in close face-to-face relationship with each other for controlling the flow of liquid through said passage, said discs being mounted for rotation relative to each other about an axis generally perpendicular to the faces of said discs;

each of said discs including a plurality of orifices extending therethrough and arranged at regular intervals around a respective circle of predetermined diameter such that the port defined by each orifice of the upstream one of said discs at the downstream face thereof communicates with a respective port defined by an orifice of the downstream one of said discs at the upstream face thereof;

each of said ports at the upstream face of said downstream disc being of greater area than the respective port at the downstream face of said upstream disc communicating therewith;

each of the orifices of the downstream one of said discs defining a port at the downstream surface thereof of

smaller area than that of the said port defined thereby at the upstream surface thereof;

said downstream disc comprising a pair of disc members fixed with respect to each other in face-to-face relationship, each of said disc members defining a portion of each of said orifices through said downstream disc, and said orifice portions of each of said disc members being arranged at regular intervals around a circle of said predetermined diameter;

each of said orifice portions and each of said orifices through said upstream disc being generally circular in cross-section perpendicular to said axis, and the diameter of the orifice portions defined by the downstream one of said disc members being not less than that of the orifice portions of said upstream disc; and

said members being fixed to each other such that the periphery of each orifice portion defined by one of said disc members is substantially tangent to the periphery of an orifice portion definded by the other of said disc members.

4,145,005

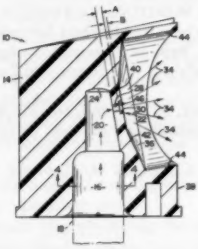
ONE-PIECE POWDER BUTTON

David Kirkel, Mount Prospect, Ill., assignor to Seaquist Valve Company, Cary, Ill.

Continuation-in-part of Ser. No. 631,668, Nov. 13, 1975, abandoned. This application Jul. 27, 1977, Ser. No. 819,336

Int. Cl.² B65D *83/06*

U.S. Cl. 239—573 **11 Claims**



1. An integral valve button of the type primarily designed to dispense a product from an aerosol dispenser, having a propellant, said valve button comprising, in combination:

a button body mounted in product dispensing disposition relative to the aerosol dispenser;

said button body comprising interior side wall means extending generally along an axis of said button body defining an expansion chamber formed therein in fluid communication with the interior of the aerosol dispenser;

terminal orifice means formed in said button body in fluid communication between said side wall means of said expansion chamber and the exterior of said button body to which the product is dispensed;

said terminal orifice means comprising a passage disposed contiguous to the said expansion chamber and defining the main path of travel of said product from said expansion chamber to the exterior of said button body;

said expansion chamber comprising a substantially enlarged interior configuration and being disposed in surrounding relation to a communicating end of said passage and being of a volume sufficient to enable evaporation of propellant in said expansion chamber upon dispensing the product and the propellant from the aerosol dispenser;

said passage having a substantially short length relative to said expansion chamber enabling substantially immediate dispensing of the product from the valve button subsequent to the evaporation of the propellant in said expansion chamber;

said passage comprising a first portion having a continuous length defined by a substantially consistent diameter and disposed contiguous to said expansion chamber;

said passage further comprising a second stepped portion disposed contiguous said first passage portion and exterior of said body;

said stepped configuration of said second portion being at least partially defined by a diameter of larger dimension and a length of less dimension than the respective dimensions of said first passage portion; and

said first passage portion having a longitudinal dimension less than the diameter of said first passage portion.

4,145,006

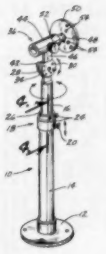
WORK PIECE MOUNTING STAND

William E. Webb, 715 S. 16th St., Centerville, Iowa 52544

Filed Nov. 11, 1977, Ser. No. 850,737

Int. Cl.² B23Q *1/04*

U.S. Cl. 269—69 **7 Claims**



1. A mounting stand comprising,

an upstanding support member having upper and lower ends,

means at the lower end of said support member for securing said support member to a supporting surface,

a mounting means at the upper end of said support means,

first means for supporting said mounting means for rotation about a generally vertical first axis,

second means for supporting said mounting means for pivotal movement about a generally horizontal second axis,

third means for supporting said mounting means for rotation about a third axis directed generally perpendicular to said second axis,

said third axis pivotally movable about said second axis through an angle of at least ninety degrees, and

fourth means for supporting said mounting means for movement axially of said third axis.

4,145,007

METHOD AND APPARATUS FOR PROCESSING WASTE MATERIALS

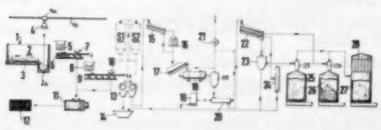
Raimund Jetzer, Nussbaumen, Switzerland, assignor to Gewerbebank Baden Aktiengesellschaft, Baden, Switzerland

Filed Jun. 14, 1977, Ser. No. 806,596

Claims priority, application Switzerland, Jun. 14, 1976, 7498/76

Int. Cl.² B02C *23/14*

U.S. Cl. 241—24 **16 Claims**



1. A method of processing waste material which contains moisture as well as heavier and lighter solid constituents and

wherein said lighter constituents include fibers, comprising the steps of (A) subjecting moist waste material to a first communuting action to thus convert said waste material into heavier particles and lighter particles including lighter fibrous particles of a first size and additional lighter particles of a larger second size; (B) segregating at least the major percentage of heavier particles from lighter particles; (C) subjecting said additional lighter particles to a cuttting action to thus reduce their size to a size not exceeding said first size; and (D) combining the lighter fibrous particles and reduced additional lighter particles and reducing the moisture content of such lighter particles.

4,145,008

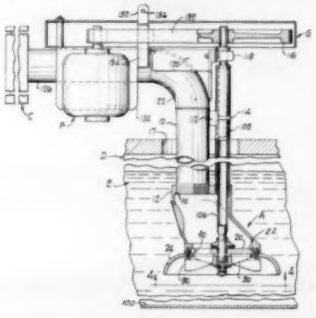
WASTE MATERIAL PUMPING APPARATUS

Dale E. Wolford, Ashland, Ohio, assignor to The Gorman-Rupp Company, Mansfield, Ohio

Filed Aug. 22, 1977, Ser. No. 826,458

Int. Cl.[2] B02C *23/36*

U.S. Cl. 241—46.17 **10 Claims**



1. In a waste material handling system having a holding tank and a centrifugal pump means having an intake within the tank for pumping material from the tank, a solid material disintegrator and vortex circulation device comprising: a housing at the pump intake terminating in a bell-like flange, a nonrotatable shear plate in said housing adjacent to the base of said flange, said shear plate having a central through opening and a plurality of through openings located radially of the central opening and closing the base of said flange except for said openings, a power-driven shaft rotatable in and extending through said central opening in said shear plate, a multi-bladed knife member nonrotatably connected to said shaft and located within said flange at the side of said shear plate facing the opening of said flange, and a plurality of plate-like paddles connected to said knife member.

4,145,009

IMPACT TYPE CRUSHER

Hirokazu Fukui, Katanoshi, Japan, assignor to Kubota Kekko Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1977, Ser. No. 826,216

Claims priority, application Japan, Mar. 14, 1977, 52-28392; Mar. 14, 1977, 52-28393

Int. Cl.[2] B02C *13/26*

U.S. Cl. 241—194 **6 Claims**

1. An impact type crusher comprising:

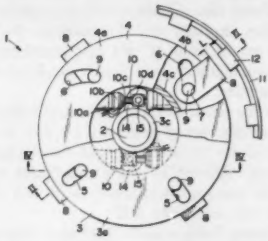
a shell housing;

a rotatable main shaft disposed axially in said shell housing;

an impact gap modulating means mounted on said shaft for rotation therewith;

a plurality of impact members mounted on said modulating means, and disposed radially about said main shaft; and,

said modulating means including means for moving simultaneously and to the same extent, all of said impact members radially of said shaft to simultaneously vary to the same extent all of the impact gaps between the outer faces of



said impact members and the inner side of said shell housing.

4,145,010

DEVICE FOR WINDING SYNTHETIC FIBERS

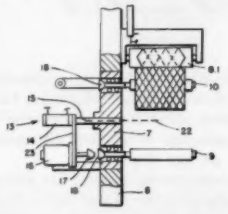
Herbert Turk, Remscheid, and Herbert Schiminski, Hückeswagen, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,817

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655544

Int. Cl.[2] B65H *54/42, 67/04*

U.S. Cl. 242—18 A **12 Claims**



1. In a peripheral drive device for winding synthetic fibers wherein at least two turnably borne tension mandrel shafts for the reception of bobbin spools are mounted on a bobbin revolver having a servo motor located on the rear side thereof which is initially positioned in axial alignment with the tension mandrel shaft having an empty bobbin spool mounted thereon which is waiting to be revolved into an operational position in which the fiber is transferred to it and the winding of the fiber upon it begins, the improvement comprising:

a swing lever fastened at one end to the servo motor and mounted at its other end for rotation about the axis of rotation of the bobbin revolver;

means mounted on said servo motor for drivingly engaging said tension mandrel shafts; and

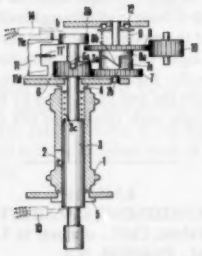
means for axially shifting said mandrel engaging means so as to engage said tension mandrel shaft having an empty bobbin spool mounted thereon when said mandrel shaft is in its waiting position and for uncoupling said engaging means when said mandrel shaft has been brought into its operating position by said bobbin revolver.

4,145,011

FILM WIND-UP MECHANISM RELEASING DEVICE

Nobuaki Date, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1977, Ser. No. 761,856
Claims priority, application Japan, Jan. 29, 1976, 51/8791
Int. Cl.[2] G03B *1/04, 1/24, 19/04*
U.S. Cl. 242—71.6 4 Claims



1. A film wind-up mechanism for a camera, comprising:
a sprocket for feeding film;
a sprocket shaft for said sprocket, said sprocket shaft being arranged to be rotatable together with said sprocket in the same direction of rotation and to be shiftable in the axial direction thereof between a first position at which film feeding can be effected and a second position at which film feeding cannot be effected;
urging means which constantly urges said sprocket shaft to normally hold the sprocket shaft at said first position;
a first rotating member which is drivingly engaged with said sprocket shaft when the sprocket shaft is in the first position and is released from driving engagement with said sprocket shaft when the sprocket shaft shifts to the second position;
a second rotating member rotating in response to a manual film wind-up operation; and
transmitting means for transmitting the rotative force of said second rotating member to said first rotating member, said transmitting means including
torque detecting means which detects the value of the torque of the film wind-up operation relative to a prescribed value, and
moving means which causes said sprocket shaft to shift from said first position to said second position thereof when said torque detecting means detects that said torque is at or above said prescribed value;
said film wind-up mechanism operating such that the rotative force of said second rotating member is transmitted to said sprocket shaft when the winding torque is less than said prescribed value and causes the moving means to shift said sprocket shaft to said second position when the winding torque is at or above said prescribed value.

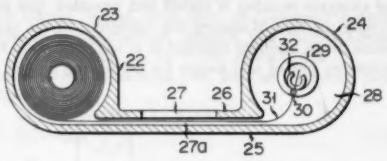
4,145,012

FILM CASSETTE

Kazuhiko Mitsui, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1977, Ser. No. 865,255
Claims priority, application Japan, Jan. 14, 1977, 52/3477[U]
Int. Cl.[2] B65H *75/28*
U.S. Cl. 242—74 4 Claims

1. A film cassette comprising a housing, a side wall, a generally hollow cylindrical film takeup shaft rotatably mounted on the side wall at one end thereof and formed in the peripheral wall thereof with an axially extending slit through which an end of a film is inserted, and a stop substantially perpendicularly, penetrating a central portion of the end of the film and extending transversely of, and beyond the slit.

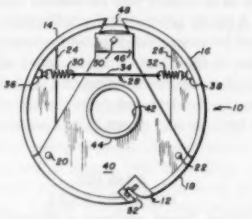


4,145,013

SLITTING MACHINE CLAMPING ASSEMBLY

Donald F. Waller, 730 Hanover Rd., Meriden, Conn. 06450

Filed Nov. 14, 1977, Ser. No. 851,347
Int. Cl.[2] B65H *75/28*
U.S. Cl. 242—74.1 14 Claims



1. A clamping assembly for securing a portion of a material to a member comprising:
clamping means movably mounted on the member, said clamping means including:
an elongated clamp bar;
fastener means having one end thereof fastened to said elongated clamp bar, the other end of said fastener means being movably supported on the assembly; and
biasing means supported in enveloping relation to said fastener means for applying a biasing force to said elongated clamp bar;
resilient means cooperable with said clamping means; and
actuating means engageable with said clamping means for effecting the movement of said clamping means to cause the portion of material to be engaged by said resilient means, said resilient means urging the portion of material against a non-yielding surface.

4,145,014

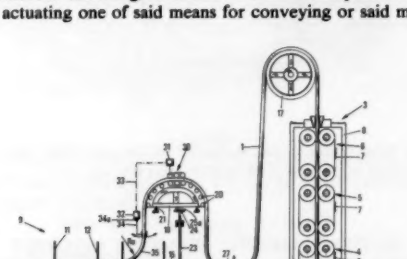
METHOD AND DEVICE FOR AUTOMATICALLY POSITIONING A FLEXIBLE ELONGATE MEMBER IN A STORAGE BASKET ROTATABLE ABOUT A VERTICAL AXIS

Michel Chatard; Guy Pignard, both of Rueil Malmaison, and Jean Thiery, Le Pecq, all of France, assignors to Institut Francais du Petrole, France

Filed Nov. 11, 1977, Ser. No. 850,827
Claims priority, application France, Nov. 22, 1976, 76 35310
Int. Cl.[2] B21C *47/00*
U.S. Cl. 242—83 9 Claims

1. A method for positioning a flexible elongate member in a storage basket rotatable about a vertical axis, said member passing, in the vicinity of the basket, on a direction reversing device displaceable in synchronism with the rotation of the basket, so as to properly position the elongate member in successive layers, each formed of a spiral winding, this method

making use of a device for reeling and unreeling the elongate member including means for conveying said elongate member to and from said ket and means for rotating said storage basket as said elongate member is reeled and unreeled, this method comprising the step of sensing the variations of the radius of curvature of the elongate member in at least one point thereof and actuating one of said means for conveying or said means



for rotating so as to reduce said variations, detecting any deformation from a given geometrical configuration of a loop portion comprised between said direction reversing means and the storage basket, in the vicinity of the latter and actuating said the other of said means for rotating and said means for conveying in response to the detected deformation, so as to bring said loop portion back to said given geometrical configuration.

4,145,015

FISHING REEL

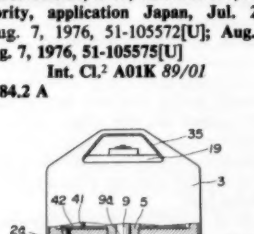
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 20, 1977, Ser. No. 817,441

Claims priority, application Japan, Jul. 28, 1976, 51-101252[U]; Aug. 7, 1976, 51-105572[U]; Aug. 7, 1976, 51-105574[U]; Aug. 7, 1976, 51-105575[U]

Int. Cl.[2] A01K *89/01*

U.S. Cl. 242—84.2 A **7 Claims**



1. A fishing reel mountable to a fishing rod with a handle bar operable to wind a fishing line on a spool, said reel comprising:

(a) a reel body;

said reel body having a rotatable handle shaft carrying a handle bar fixed thereto mounted on said reel body, a rotatable shaft mounted on said reel body at a right angle to said rotatable handle shaft and driven by the rotatable handle shaft and a nonrotatable spool mounted coaxially with said rotatable shaft;

(b) a rotatable frame fixed to said rotatable shaft to be rotatably integral therewith,

said rotatable frame having a guide lever for guiding the fishing line to said spool;

(c) a cover for covering said spool and rotatable frame,

said cover being mounted to said reel body and having a hole eccentric with respect to a center line of the cover through which said fishing line passes so that the draw-out point of the line coincides with the center of the cover, and

(d) a mounting leg for mounting said reel body to said fishing rod,

said mounting leg extending from said reel body in a direction parallel to the axis of said rotatable shaft, and having at the end a mount seat of a length extending lengthwise of the fishing rod, said mount seat being substantially at a right angle with respect to the axis of said rotatable shaft, so that said reel body is mounted to said fishing rod through said mounting leg in such a manner that the center line of said through hole extends substantially at a right angle to the longitudinal direction of said rod, whereby the fishing line is drawn out through said through hole toward the end of said rod by being bent substantially at a right angle with respect to the center line of said through hole.

4,145,016

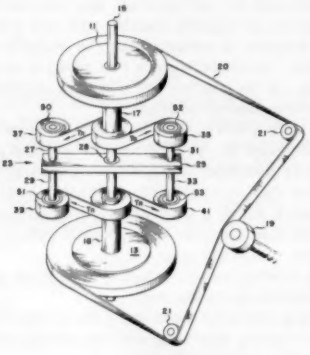
TENSIONING APPARATUS

Selmer L. Wiig, Walnut, Calif., assignor to Lockheed Electronics Company, Inc., Plainfield, N.J.

Filed Mar. 23, 1977, Ser. No. 780,319

Int. Cl.[2] G03B *1/04*; G11B *15/32*

U.S. Cl. 242—193 **11 Claims**



1. In a capstan driven web system having a take-up reel and a supply reel coaxially mounted for rotation about a support shaft, apparatus for providing tension on the web between the two coaxial reels, said apparatus comprising:

a coupling arm mounted for rotation about said support shaft between said take-up and supply reels;

an even number of spring storage shafts mounted on said coupling arm; and

a plurality of torsional springs equal in number to said storage shafts, each said spring mounted to a respective said storage shaft by a first end, the second ends of a first half of said springs being connected to said supply reel, the second ends of a second half of said springs being connected to said take-up reel.

4,145,017

GLIDE PROJECTILE HAVING JETTISONABLE KEEL FIN

Lothar Stiklorus, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed May 4, 1977, Ser. No. 793,508

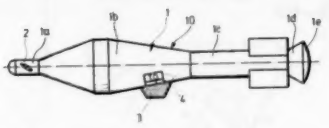
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648523

Int. Cl.[2] F42B *15/10, 13/30*

U.S. Cl. 244—3.25 **4 Claims**

1. In a non-spinning glide projectile under the influence of a cross-wind and an initial yaw having a body and at least one lift-producing device on the body, an improvement compris-

ing, an aerodynamic keel fin on the body intermediate the length thereof of a size sufficient for causing a roll of the glide projectile to compensate for the cross-wind and initial yaw thereof, and means for separating the keel fin from the body at



a time when the ratio between the value of a roll needed to compensate for the cross-wind and for the initial yaw is substantially equal to the ratio between a roll needed to compensate for a cross-wind and for an initial yaw in a glide projectile without said keel fin.

4,145,018

PROTECTIVE DEVICE FOR RAILROAD SIGNALING APPARATUS

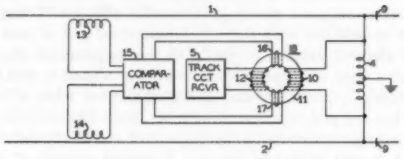
Mario Poggio, and Federico Muratore, both of Turin, Italy, assignors to WABCO Westinghouse, Turin, Italy

Filed Feb. 23, 1978, Ser. No. 880,398

Claims priority, application Italy, Mar. 18, 1977, 67601 A/77

Int. Cl.[2] B61L *21/06*

U.S. Cl. 246—34 R **10 Claims**



1. In combination with a track circuit for an insulated track section in an electrified railroad with a propulsion current return circuit through both track rails and an impedance bond connected across the rails at each end of said section and having a center tap connected to a common return circuit path for normally balancing the propulsion current between the rails, said track circuit including a transmitter source of energy coupled to the rails at one end of said section by the corresponding impedance bond for transmitting energy of a selected frequency and a receiver means coupled to the rails at the other end of said section by the corresponding impedance bond and responsive to energy of said selected frequency for registering the nonoccupancy or occupancy of said section by a train in accordance as energy is received or absent, respectively, a fault protection arrangement comprising,

(a) a coupling means connected for coupling said receiver means and the corresponding impedance bond at said other end,

(1) said coupling means normally in a first condition to pass energy from said bond to said receiver means and operable to a second condition, when a control signal is applied, for inhibiting the passing of energy to said receiver means, and

(b) a comparator means coupled to said rails at said other end and responsive to said propulsion current for generating an output signal when the level of propulsion current in the two rails differs by a predetermined amount,

(c) said comparator means connected for applying said output signal to operate said coupling means to its second condition to inhibit the registry of an unoccupied track section when the propulsion current is unbalanced.

4,145,019

SUPPORT ELEMENT FOR INSTALLATION IN THE SUPPORT ASSEMBLY OF A VERTICAL ELECTRIC MACHINE

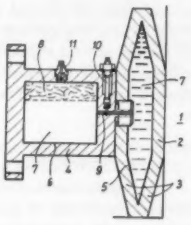
Manfred Utecht, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,665

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2644413

Int. Cl.[2] F16F *15/00*

U.S. Cl. 267—121 **3 Claims**



1. A support element for installation in the support assembly of a vertical electric machine comprising:

a resilient first housing means which exhibits elasticity in an action direction and volume stiffness otherwise with respect to an increase in internal pressure, said resilient housing means having its interior completely filled with a viscous medium comprised of silicone rubber;

a rigid second housing means which exhibits volume stiffness with respect to an increase in internal pressure, said second housing means having its interior filled partially with a viscous medium comprised of silicone rubber and partially with a compressible medium;

and means including choke means for connecting the interior of said first housing means to the interior of said second housing means.

4,145,020

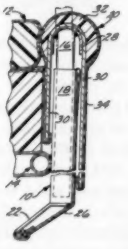
RETRACTABLE APPARATUS FOR SUPPORTING AN ELEMENT

David L. Webster, Orange, Calif., assignor to Kustom Fit Manufacturing Company, South Gate, Calif.

Filed Jan. 19, 1978, Ser. No. 870,759

Int. Cl.[2] F16M *11/00*; A47C *7/54*

U.S. Cl. 248—161 **19 Claims**



1. Retractable apparatus for supporting an element, said apparatus comprising:

elongated first support means for attachment to a supporting frame and having a first engagement portion; and

elongated second support means adapted to mount an element to be supported and having a second engagement portion, said second support means being movable in a longitudinal path generally parallel to said first support

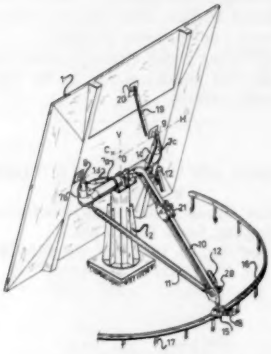
means and between a retracted position and an extended position relative to said first support means, said second engagement portion being out of longitudinal alignment and freely movable relative to said first engagement portion during movement of said second support means along said longitudinal path, said first and second engagement portions being adjacent in said extended position, said second support means in said extended position being laterally movable relative to said first support means to locate said first and second engagement portions in general longitudinal alignment whereby longitudinal movement of said second support means toward said retracted position engages said first and second engagement portions in overlapping, locked relation and thereby prevents lateral movement of said second support means and also prevents further longitudinal movement of said second support means toward said retracted position.

4,145,021

ALTAZIMUTH ORIENTATION SUPPORT

Jean-Pierre Gaechter; Charles Bourdeau, both of Castanet-Tolosan, and Guy Vialaret, Toulouse, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 8, 1977, Ser. No. 822,818
Claims priority, application France, Aug. 11, 1976, 76 25026
Int. Cl.[2] A45D *19/04*
U.S. Cl. 248—371 **12 Claims**



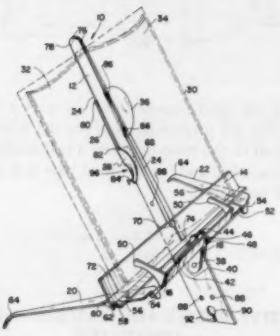
1. An altazimuth orientation support for permitting orientation of a panel in elevation and in azimuth comprising a substantially vertical pivot, a stationary central column having support means for said pivot and adapted to guide said pivot in rotation about a vertical axis, a mount integral with said pivot for carrying said panel so that the center of said panel is adjacent said vertical axis, said mount including articulation means between said mount and said panel for enabling said panel to pivot about a horizontal axis, a movable framework for maneuvering said panel in azimuth extending rearwardly from said panel and being rigidly fastened on said mount for defining the panel orientation about said vertical axis, means for guiding the rear end of said framework on a circular trajectory centered on said vertical axis, means for driving the rear end of said framework along said guiding means, frame means associated at one end with said articulation means and having at its other end a foot movable along said framework for maneuvering in elevation, and means for driving said foot along said framework for maneuvering said panel in elevation.

4,145,022

BOOK HOLDER

Edward C. Comfort, Via Vianca 2 VL-316, Villa Fontana Carolina, P.R. 00630

Filed Nov. 3, 1977, Ser. No. 848,107
Int. Cl.[2] A47B *97/04*
U.S. Cl. 248—453 **7 Claims**



1. A book holder comprising a bar, an elongated T-shaped element, a plate, one end of said plate pivotably secured to said bar, means to bias the other end of said plate towards one end of said bar, a U-shaped element, means to removably affix said U-shaped element to said plate, said U-shaped element having legs, the free ends of said legs being disposed directed towards a plane in which said bar resides when said U-shaped element is affixed to said plate, means to removably affix said T-shaped element to said bar such that the longitudinal axis of said T-shaped element extends normally to the longitudinal axis of said bar, a cord, one end of said cord being affixed to said bar at a location intermediate said T-shaped element when affixed to said bar and said other end of said bar, hook-like element, an elongated elastic member, a first portion of said elastic member secured to said hook-like element, a second portion of said elastic member affixed to the other end of said cord, said bar having a projection on an exterior surface thereof, said projection being located intermediate said one end and said other end of said bar on a surface thereof opposite a surface carrying said means to affix said T-shaped element to said bar, said T-shaped element having a leg portion and a cross element portion, said leg portion of said T-shaped element being disposed intermediate said cross-element portion of said T-shaped element and said one end of said bar when said T-shaped element is affixed to said bar.

4,145,023

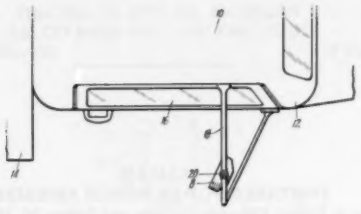
VEHICLE MIRRORS

Leonard F. Lukey, Mentone, Australia, assignor to Fifth Patroy Proprietory Ltd., Melbourne, Australia

Filed Oct. 11, 1977, Ser. No. 841,198
Claims priority, application Australia, Oct. 12, 1976, PC7690
Int. Cl.[2] B60R *1/02*
U.S. Cl. 248—479 **5 Claims**

1. A mirror assembly for mounting on a vehicle door, said assembly comprising (a) a generally planar mirror having a vertical center line passing through the center of gravity of said mirror, said vertical line dividing said mirror into a first half nearer said vehicle door and a second half farther from said door, said mirror having a rear surface to which is secured a mirror mounting, said mirror mounting being centered on said vertical line or being secured to said second half, and (b)

a generally flat balance weight secured to said first half of the rear surface of said mirror so as to create a static imbalance in



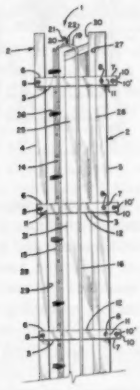
said mirror which resists a slam force acting upon said mirror upon the rapid closing of said vehicle door.

4,145,024

FORM FOR REINFORCED CONCRETE WALL

Edward B. Ward, 820 Winchester, Kansas City, Mo. 64125

Filed Oct. 27, 1977, Ser. No. 846,154
Int. Cl.[2] E04G *11/12, 17/08*
U.S. Cl. 249—35 **4 Claims**



1. In a form for poured concrete walls having a plurality of prefabricated, interconnected form panels, and wherein first and second of said panels are positioned on opposed sides of a wall cavity in a spaced apart and laterally aligned relation, the improvement of a form tie comprising:

(a) at least two, flat, rectangularly shaped tie bars disposed in a mutually spaced apart relation; each of said tie bars extending laterally between said first and second form panels, and having an aperture through each end thereof for connecting the same with said first and second form panels respectively; and

(b) first and second elongate rods, each positioned substantially perpendicularly to each of said tie bars and being fixedly attached thereto; said first and second rods being mutually parallel and spaced apart, and securely retaining said tie bars in alignment; said first rod being shaped for connecting reinforcing mesh thereto and positively positioning said mesh along a predetermined plane between said first and second form panels; and wherein

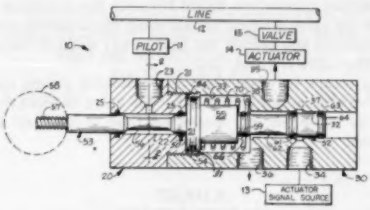
(c) said first and second rods each have an upper end thereof which is bent into an L-shape; said upper end of each of said rods facing inwardly and overlapping in a side-by-side fashion, and being fixedly interconnected to form a U-shaped bracket which is normally upwardly oriented and shaped to cradle and retain a horizontally disposed reinforcing member therein.

4,145,025

CONTROL DEVICE

Ned A. Bergeron, Houma, La., assignor to B. W. B. Controls, Inc., Houma, La.

Filed Dec. 13, 1976, Ser. No. 750,119
Int. Cl.[2] F16K *3/24*
U.S. Cl. 251—63 **3 Claims**



1. A device for emitting a first fluid signal to a first member as a function of a second fluid signal received from a second member, said device comprising:

a housing having an axial bore therethrough as well as first and second fluid signal inlet means and fluid signal outlet means;

a piston-carrying slide valve member movable within said axial bore from a first position wherein said piston is positioned near one end of said housing to a second position wherein said piston is removed from said one end;

means, operative when said slide valve member is in said second position, permitting said second fluid signal to bias said slide valve member toward said second position; and

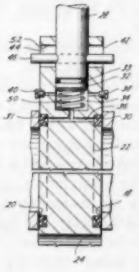
means preventing said second fluid signal from biasing said slide valve member toward said second position when said slide valve member is in said first position, said preventing means including means for causing force exerted by second fluid signal to be equally and oppositely directed.

4,145,026

VALVE WITH SELF-ACTUATING FLUID SEAL

Clyde H. Chronister, #4 Kings Row, Houston, Tex. 77069

Filed Aug. 22, 1977, Ser. No. 826,299
Int. Cl.[2] F16K *31/44*
U.S. Cl. 251—80 **3 Claims**



1. A valve comprising,

a valve body,

a valve seat in the valve body,

a valve element adapted to make with the seat,

valve-actuating means for moving the valve element toward and away from the valve seat,

stop means in the valve body for stopping movement of the valve element when the valve element is positioned against the valve seat,

resilient fluid-actuated seal means recessed in the valve element, said seal means bonded to said valve element for

preventing fluid in the valve body from reaching the back of the seal means,

fluid-actuation means including a piston and cylinder in fluid communication with said seal means for actuation of said seal means away from said valve element and toward said valve seat, said piston fixedly connected to said valve-actuating means whereby the seal means are fluid pressurized and released by movement of the actuation means,

lost motion connection means between the actuating means and the valve element for allowing the actuating means to pressurize and release the seal means without movement of the valve element, and

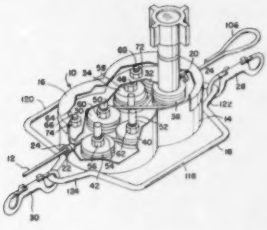
spring means between the valve-actuating means and said valve element for insuring that the valve element does not move while the seal means are fluid pressurized and released.

4,145,027

SAFETY DEVICE

Joseph Brimo, 1523 N.Hills Ave., Willow Grove, Pa. 19090

Continuation of Ser. No. 734,538, Oct. 21, 1976, abandoned.
This application Nov. 25, 1977, Ser. No. 854,631
Int. Cl.[2] A62B *1/08*; B66D *5/00*
U.S. Cl. 254—156 **2 Claims**



1. In a safety device suitable for lowering a building occupant along a cable having a portion thereof affixed to the building, the combination of

a body having a cable passing therethrough, said body having a longitudinal axis and a transverse axis;

a plurality of cable pulleys rotatively carried by the body,

some of said pulleys being positioned to the right of the longitudinal axis and some being positioned to the left of the longitudinal axis, at least some of said pulleys being permanently spaced an unequal distance from the said longitudinal axis,

said cable being trained about the pulleys to form a serpentine path within the body; and

a brake pulley means rotatively carried by the body,

said brake pulley means comprising a brake pulley, having a flat circular surface, a first brake lining applied directly to the circular flat surface of the brake pulley to retard the rotation thereof and a handle means to vary the pressure of the brake lining against the brake pulley,

said brake pulley means further comprising a threaded stud secured to the body, the handle being threadedly engaged upon the stud to vary brake pressure,

the brake pulley being rotatively mounted on the stud and comprising a peripheral groove into which the cable is positioned to rotate the brake pulley as the cable passes through the body, the peripheral groove being of size to receive a single turn of the cable,

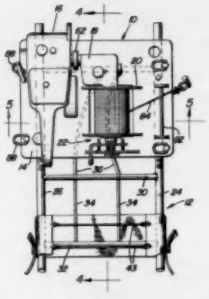
the cable on the brake pulley always being positioned the same distance from the threaded stud under all conditions of use, some of said pulleys being positioned on the inlet side of the transverse axis and wherein all of said pulleys are spaced an unequal distance from said transverse axis and wherein said brake pulley is so positioned relative to said cable pulleys that the cable is always seated within more than one half the circumferential length and less than the entire circumferential length of the brake pulley groove.

4,145,028

PORTABLE POWER WINCH ASSEMBLY

Omer J. Kelley, Colorado Springs, and Judson M. Harper, Fort Collins, both of Colo., assignors to KOFK, Inc., Pueblo, Colo.

Filed Dec. 19, 1977, Ser. No. 862,442
Int. Cl.[2] B66D *3/00*
U.S. Cl. 254—186 R **5 Claims**



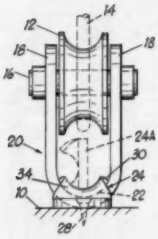
1. In combination, a light weight support frame, a combined motor and winch assembly including a rotary winding member and means drivingly connecting said motor to said winding member supported from said frame, said frame including elongated opposite side members interconnected by means of bowed transverse members extending and secured between said side members at points spaced therealong with the convex sides of said transverse members facing outwardly of one side of said frame, said motor and winch assembly being supported from and projecting outwardly of said one side of said frame, shoulder strap means supported from said frame for support of said frame from the back of a person over whose shoulders said shoulder strap means pass with the concave sides of said transverse members opposing and extending transversely of said back, a base plate, means removably supporting and anchoring said base plate to said frame, said motor and winch assembly being supported from the side of said base plate remote from said frame, said opposite side members including generally straight and parallel major length portions, said plate including a pair of parallel channel members extending along, opening laterally outwardly toward and anchored to the side of said plate opposing said frame, the outer portions of said channel members abutting and extending along said major length portions, each of one pair of ends of said channel members including a pair of aligned opposite side transverse bores formed therethrough, said opposite side members each including slightly outwardly offset bracket portions removably telescopically received within the other pair of corresponding ends of said channel members, said opposite side members including elongated spring biased pin portions reciprocately supported therefrom for lengthwise shifting of said pin portions transversely of said opposite side members, said pin portions being lengthwise received through the corresponding bores and lengthwise retractable therefrom, said pin portions and offset bracket portions serving to releasably anchor said plate to said frame.

4,145,029

CLEVIS AND MOUNTING ANCHOR FOR A PULLEY

Allen R. Johns, Harbert Rd. Rte. 1, Box 183, Sawyer, Mich. 49125

Filed Nov. 17, 1977, Ser. No. 852,516
Int. Cl.[2] B66D *3/04, 1/36;* F16C *11/06*
U.S. Cl. 254—188 **6 Claims**



1. A pulley mount comprising a clevis having a pulley rotatably mounted between the outer ends of its arms, and a mounting clamp bar adapted to be extended through the bight of the clevis and attached at its ends to a mounting surface, said clevis and mounting clamp being characterized by

concentric surfaces formed on the bight of said clevis and disposed about an axis parallel to the plane of rotation of said pulley,

coplanar end portions on the ends of said clamp bar and having holes therein for receiving fasteners for forming the attachment of the bar to said mounting surface,

and a center portion on said clamp bar off-set from said end portions,

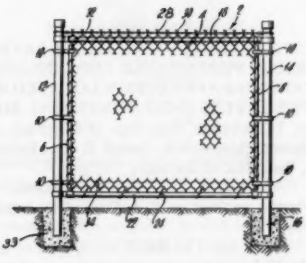
said center portion having a downwardly convex lower surface extending along a segment of a cylinder having a radius equal to the radius of the inner surface of the bight of said clevis, and spaced from the plane of the bottom of said end portions by a distance approximately equal to and no greater than the thickness of said bight between said concentric surfaces.

4,145,030

GROUNDED FENCE FABRIC

Glen E. Ingraham, Lebanon, N.J., assignor to Colorguard Corporation, Raritan, N.J.

Division of Ser. No. 582,834, Jun. 2, 1975, Pat. No. 4,031,284.
This application May 16, 1977, Ser. No. 797,239
Int. Cl.[2] H05F *3/02*
U.S. Cl. 256—1 **11 Claims**



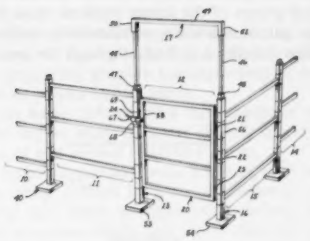
1. In a fence fabric construction formed of a plurality of individually coated wires each composed of a metal core enveloped by a heat-disintegrable electrically non-conductive coating; adjoining pairs of said coated wires being engaged at, at least, one point along their length; the improvement that comprises an elongated metal conductor element permanently interlocked by, and defining a passage through, a plurality of said points where engagement of said adjoining wires of said fabric is effected and in electrical connection with the metal cores of each of said coated wires, and wherein said fence fabric is mounted upon a plurality of electrically conductive posts secured to a conductive foundation; said elongated electrical conductor being attached to, and in electrical connection with, each of at least two of said posts.

4,145,031

MODULAR DISMANTLEABLE FENCE

Ralph Baker, II, 6755 S. Settler, Tucson, Ariz. 85706

Filed Jan. 9, 1978, Ser. No. 867,922
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—65 **7 Claims**



1. A takedown modular fence, said fence comprising in combination:

(a) a plurality of posts, each said post including base means for supporting said post and upright means extending from said base means;

(b) a plurality of rails, each said rail including orthogonal end means for penetrably mounting said rail upon two adjacent ones of said uprights;

(c) spacer means penetrably mountable upon said uprights intermediate said orthogonal ends of adjacent ones of said rails for defining the vertical separation between adjacent ones of said rails;

(d) a gate way comprising:

i. a gate;

ii. hinge means for pivotably attaching one side of said gate to one of said posts; and

iii. latch means for securing another side of said gate to another of said posts; and

(e) a first stanchion extending upwardly from said one post, a second stanchion extending upwardly from said other post and a cross member for interconnecting the upper ends of said first and second stanchions;

whereby, said rails and said spacers are slidably and removably mountable upon respective ones of said uprights to define said fence.

4,145,032

LIVESTOCK GATE

Larry L. Robertson, R.R. 1, La Prairie, Ill. 62346

Filed Mar. 25, 1977, Ser. No. 781,178
Int. Cl.[2] E04H *17/00*
U.S. Cl. 256—73 **1 Claim**

1. A livestock gate, comprising:

an upper, horizontally extending support member;

a lower, horizontally extending support member; and

a plurality of horizontally spaced non-overlapping bars substantially identical in cross-section extending between

said upper and lower support members, each such bar having a center portion substantially in a vertical plane and a pair of integral, vertically extending edge portions inclined horizontally from the vertical plane of said center portion and joining said center portion at substantially equal acute angles so as to define a vertically extending channel between said edge portions, said bars being disposed between said upper and lower support members such that alternate bars are closely spaced and face in opposing directions, the channels of adjacent bars face in opposite directions, and such that all of said bars are situated in-line with respect to each other, whereby adjacent edge portions of successive bars are in substantially parallel vertical planes which form an oblique angle to the vertical planes of the center portions so as to define between said bars a series of alternately inclined slots for limiting visibility and drafts through the gate.

4,145,033

HOT BLAST STOVE AND METHOD OF OPERATION

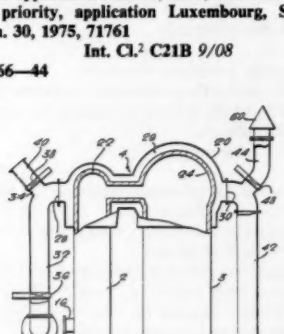
Ernest P. Kuntziger, Assenede, Belgium, assignor to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Division of Ser. No. 612,219, Sep. 10, 1975, Pat. No. 4,022,573. This application Feb. 10, 1977, Ser. No. 767,661

Claims priority, application Luxembourg, Sep. 20, 1974, 70951; Jan. 30, 1975, 71761

Int. Cl.[2] C21B *9/08*

U.S. Cl. 266—44 **15 Claims**



15. A method of operating a hot blast stove of the type having a steel jacket susceptible to intercrystalline stress corrosion when exposed to condensed deleterious vapors at high temperatures and pressures, the stove being employed in the production of hot air for injection into a blast furnace, the method comprising the steps of:

delivering a combustible fuel and combustion air to the stove during a first mode of operation;

delivering air at a pressure in excess of 5 atmospheres to the stove for heating in the absence of combustible fuel and combustion air during a second mode of operation; and

applying a fluid at the pressure prevailing within the stove to the exterior of the stove jacket during at least the second mode of operation to reduce intercrystalline stress corrosion of the steel jacket through establishment of a pressure balance across at least a portion of the jacket.

4,145,034

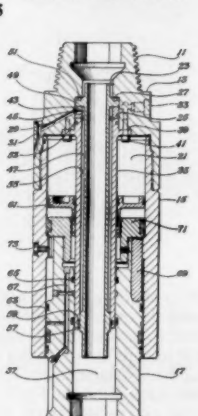
HEAT SHIELD FOR A DRILL STRING SHOCK ABSORBING APPARATUS

Billy F. Dyer, Houston, Tex., assignor to Hughes Tool Company, BHouston, Tex.

Filed Mar. 16, 1978, Ser. No. 887,405

Int. Cl.[2] E21B *17/02*

U.S. Cl. 267—125 **7 Claims**



1. In a shock absorbing apparatus for use in a drill string of the type having first and second members telescopingly interconnected, the first and second members having axial passages therethrough for the passage of drilling fluid, a tubular member mounted to one of the first and second members and telescopingly inserted in the axial passage of the other member, and an annular sealed chamber between the first and second members containing pressurized fluid for absorbing load and shock, the improvement comprising:

a cylindrical liner mounted concentrically inside the tubular member;

the liner having an outer diameter less than the inner diameter of the tubular member, defining an annular space between the tubular member and the liner for thermally insulating the tubular member from the drilling fluid passing through the axial passages and liner.

4,145,035

DEVICE FOR SEPARATING MULTI-LAYERED, TRANSVERSELY PERFORATED CONTINUOUS STRIPS HAVING CARBON-PAPER STRIPS LOCATED BETWEEN THE WEB LAYERS INTO INDIVIDUAL SHEETS

Erich Moser, Taufkirchen, Fed. Rep. of Germany, assignor to RENA-Büromaschinenfabrik GmbH & Co., Deisenhofen bei München, Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,492

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618476

Int. Cl.[2] B65H *41/00*

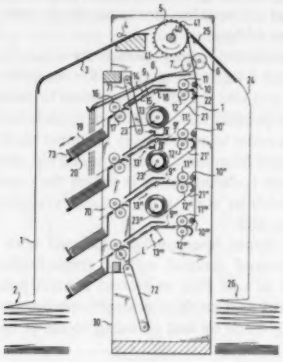
U.S. Cl. 270—52.5 **12 Claims**

1. A device for separating a continuous, transversely perforated multi-layered strip into individual strips, comprising:

a base frame; and

a plurality of strip handling means mounted on said base frame for processing said multi-layered strip, each of said strip handling means including (1) a separator device for separating an individual continuous and transversely perforated strip from said multi-layered strip, (2) form burst-

ing means for effecting a severing of said individual continuous strip into individual sheets subsequent to passing



through said separator device, and (3) storage means for storing said individual sheets therein.

4,145,036

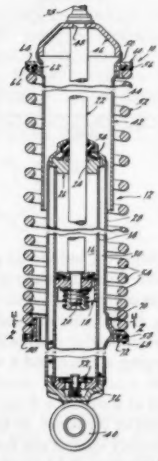
VEHICLE SUSPENSION DEVICE

August G. L. Moonen, Ulbeek, and Eugene A. H. Moyaerts, Sint-Truiden, both of Belgium, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Continuation of Ser. No. 746,711, Dec. 2, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,549

Int. Cl.[2] F16F *13/00*

U.S. Cl. 267—8 R **2 Claims**



1. A vehicle suspension device comprising,

a telescopic shock absorber including an elongated tubular housing,

a piston reciprocably disposed within said housing and connected to one end of a piston rod extending axially outwardly from one end of said housing,

attachment means on the outer end of said piston rod and on the end of said housing opposite said piston rod for securing said device to the sprung and unsprung portions of an associated vehicle,

a helical coil spring extending coaxially of said shock absorber,

first and second spring support members for supporting the opposite ends of said spring,

one of said spring support members including a spring support flange member,

said flange member having a spring support portion and a sleeve portion adapted to have part of said housing extend therethrough, and

a plurality of circumferentially spaced, radially outwardly projecting embossments formed in the peripheral wall of said housing for affixing said flange member to said device,

each of said embossments comprising an upper portion and a lower portion, with said upper portions being defined by a first diameter imaginary circle which is larger in diameter than the outer diameter of said housing, and said lower portions being defined by a second diameter imaginary circle whose diameter is larger than the diameter of said first imaginary circle,

said sleeve portion of said flange member having circumferentially spaced, axially extending lands and radially outwardly projecting grooves corresponding in number to the number of said embossments,

said grooves being defined by a third diameter imaginary circle having an inner diameter slightly larger than the diameter of said second imaginary circle,

said lands having upper and lower portions, with said upper portions being defined by a fourth diameter imaginary circle and said lower portions being defined by a fifth diameter imaginary circle, said fourth diameter imaginary circle being equal or slightly larger in diameter than said first diameter imaginary circle and said fifth diameter imaginary circle being equal or slightly larger than the diameter of said second diameter imaginary circle, and both said fourth and fifth diameter imaginary circles being smaller in diameter than said third diameter imaginary circle and larger in diameter than the diameter of said housing,

whereby when said flange member is rotated relative to said housing to a position wherein said embossments are in registry with said lands and said housing and said flange member are thereafter moved axially of one another,

said upper and lower portions of said embossments will move into locking engagement with said upper and lower portions, respectively of said lands, to secure said flange member directly upon said housing.

4,145,037

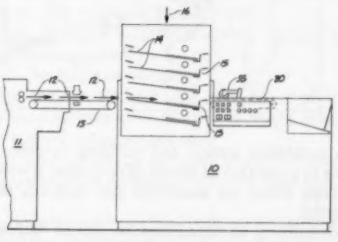
VERTICAL COLLATOR-SORTER

Hans C. Mol, Wilton, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Apr. 25, 1977, Ser. No. 790,349

Int. Cl.[2] B65H *39/05*

U.S. Cl. 270—58 **13 Claims**



1. A combined sorting and collating machine selectively operable in a plurality of modes of operation in which a plurality of copy sheets are assembled into booklets, said machine comprising:

a. means defining an infeed location and an outfeed location;

b. means defining a plurality of adjacent bins for storing copy sheets, said bins being relatively movable to, and operatively associated with said means defining said in-

feed and outfeed locations, said bins arranged in a substantially vertical array of substantially horizontally oriented trays disposed one above another;

c. conveying means operatively associated with said plurality of bins for conveying copy sheets seriatim from said infeed location to each respective bin of said plurality of bins and for conveying copy sheets from each respective bin of said plurality of bins to said outfeed location;

d. positioning means operatively associated with said bin array for causing relative movement between the bins and said conveying means whereby copy sheets can be fed into, and out of, each respective bin;

e. a copy sheet ejecting means operatively associated with said bins for ejecting copy sheets from said bins to said conveying means for delivery to said outfeed end of said machine;

f. a first control means for actuating said positioning means in a sequantial manner to cause a preselected number of said bins to assume a relative position for receiving copy sheets from said conveyor means in order to assemble in each preselected bin a booklet thereby defining a machine sorting mode in which the number of booklets corresponds to said number of preselected bins;

g. a second control means for actuating said positioning means and said sheet ejecting means in a sequential manner to cause said sheet ejecting means to eject copy sheets from a preselected number of said bins to said conveying means in order to successively assemble booklets comprising one copy sheet from each of said preselected bins, thereby defining a machine collating mode in which the number of copy sheets in each booklet corresponds to said preselected number of bins; and

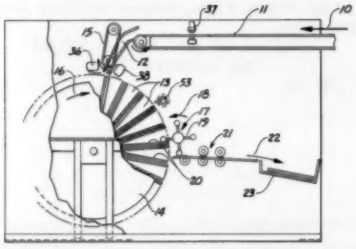
h. selector means operatively associated with both said first and second control means, respectively, for selecting which of said first or second control means is operable, whereby said machine is selectively operable in either said sorting mode or said collating mode of operation.

4,145,038

ROTARY DRUM COLLATOR-SORTER

Hans C. Mol, Wilton, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,089
Int. Cl.[2] B65H *32/045*
U.S. Cl. 270—58 **6 Claims**



1. A combined sorting and collating machine selectively operable in a plurality of modes of operation in which a plurality of copy sheets are assembled into booklets, said machine comprising:

means defining an infeed location and an outfeed location;

a rotatable drum having a plurality of bins for storing copy sheets, said bins being angularly arranged about the drum;

conveyor means operatively associated with said plurality of bins for conveying copy sheets seriatim from said infeed location to said plurality of bins;

rotatable withdrawing means disposed adjacent said drum for removing copy sheets from the bins of said drum;

a first control means operatively connected to said drum for rotatably actuating said drum to receive copy sheets in a sequential manner in a predetermined number of said bins in order to assemble in each predetermined bin a booklet, thereby defining a machine sorting mode in which the number of booklets corresponds to said predetermined number of bins;

a second control means operatively connected to said drum and said withdrawing means for rotatably actuating said drum and said withdrawing means to extract copy sheets in a sequential manner from a predetermined number of bins in order to successively assemble booklets comprising one sheet from each predetermined bin, thereby defining a machine collating mode in which the number of sheets in each booklet corresponds to said predetermined number of bins; and

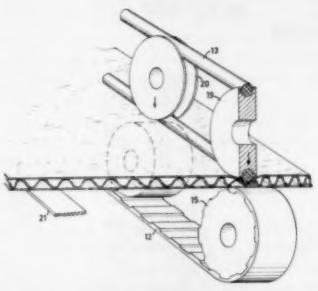
selector means operatively associated with both said first and second control means, respectively, for selecting which of said first or second control means is operable, whereby said machine is selectively operable in either said sorting mode or said collating mode of operation.

4,145,039

METHOD AND APPARATUS FOR CONVEYING SHEETS OF CORRUGATED CARDBOARD OR SIMILAR MATERIAL THROUGH A PROCESSING MACHINE

Stig M. Carlsson, Örebro, Sweden, assignor to Sunds AB, Sweden

Filed Sep. 15, 1977, Ser. No. 833,552
Claims priority, application Sweden, Sep. 15, 1976, 7610222
Int. Cl.[2] B65H *5/02*
U.S. Cl. 271—274 **7 Claims**



1. A method of conveying individual prefabricated sheets of corrugated cardboard or similar material through a processing machine, the machine comprising a feed-in unit and at least one unit with processing means, said method comprising: gripping the sheet along a marginal edge thereof between a first moving belt with a flat gripping surface and a second belt moving at the same speed with a non-planar gripping surface, said surfaces being disposed at a distance from one another which is less than the thickness of the sheet, so that the non-planar belt clamps the sheet securely against the flat belt while temporarily deforming the thickness of the sheet at its marginal edge.

4,145,040

GRIPPER DRUM

Ernst Huber, Wettingen, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

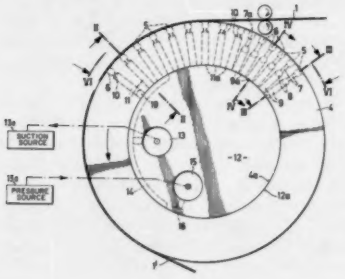
Continuation of Ser. No. 729,152, Oct. 4, 1976, abandoned. This application Sep. 7, 1977, Ser. No. 831,294
Claims priority, application Switzerland, Oct. 10, 1975, 13214/74
Int. Cl.[2] B65H *5/12*
U.S. Cl. 271—276 **5 Claims**

1. A gripper drum having a peripheral surface, end faces and an axis of rotation;

a plurality of ducts disposed below said peripheral surface and extending from one end face parallel with said axis;

a plurality of apertures in said peripheral surface arranged in rows parallel to said axis, all of the apertures in each said row opening only into a correspondingly located duct, said rows of apertures forming on said peripheral surface an active suction zone having two opposite boundary lines each defined by one row of the apertures;

a conduit means for connection of a suction source;



conduits each coupling the conduit means to a different one of said ducts; and

means for selectively sealing off the apertures in a row from said conduit means; wherein said conduits couple the duct connected to that row of apertures nearest to at least one of said boundary lines of said zone near said one end face to said conduit means and the remaining ducts at positions which are further away from said one end face.

4,145,041

AUTOMATIC DOCUMENT HANDLING APPARATUS

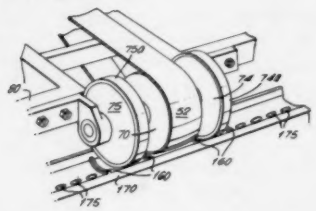
Jeffrey Kew, Upton St. Leonards, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1977, Ser. No. 780,882

Claims priority, application United Kingdom, Jun. 25, 1976, 26582/76

Int. Cl.[2] B65H *9/04, 5/02, 29/20*

U.S. Cl. 271—233 **5 Claims**



1. A document handling apparatus comprising

a document driving belt extending across a work surface between first and second edges of the surface over which edges the documents are respectively fed onto and ejected from the surface;

means for selectively driving the belt in one direction towards the second surface edge for advancing a document across the surface and in the opposite direction for positioning a document on the surface against a registration edge at said first surface edge;

document drive means adjacent said second surface edge located laterally of said document driving belt and arranged to be driven with the belt in the document advancing direction only and act on a document in contact therewith to prevent the document from being driven by the belt as the belt is driven in the opposite direction, wherein said document drive means comprises a pair of rotary members flanking the belt adjacent the second edge of the surface, wherein said document driving belt is an endless belt passing over first and second belt-supporting rollers at said edges of the surface respectively and the rotary members comprise rollers mounted coaxially with the second belt-supporting roller;

a pair of stationary curved guide surfaces at opposite sides of said rotary members and said second belt supporting roller and spaced therefrom, said guide surfaces being arranged to urge a sheet against the periphery of said rotary members and said second-belt supporting roller in a curved path.

4,145,042

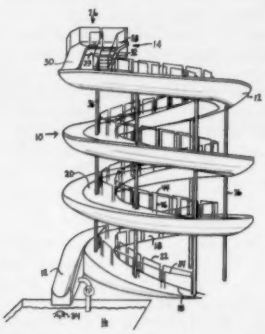
SLIDE

Klaus Becker, Wetter; Uwe Lichtenvort, Essen, and Dieter Behrmann, Hagen, all of Fed. Rep. of Germany, assignors to DEMAG Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Mar. 3, 1977, Ser. No. 774,033

Int. Cl.[2] A63G *21/10, 21/18*

U.S. Cl. 272—56.5 R **14 Claims**



14. A self-supporting tower slide for people which may be assembled on any relatively level surface, comprising

(a) an upper slide access platform;

(b) a ground level slide exit;

(c) a continuous slide extending from said upper slide access platform to said slide exit;

(d) said slide having a semi-circular slide surface; the improvement characterized by

(e) said slide formed as a helix;

(f) a vertical support for said slide including a plurality of pairs of vertical stanchions of varying height arranged in a circle and extending to said slide;

(g) a flange plate connecting each pair of vertical stanchions;

(h) a horizontal brace extending between each said flange plate;

(i) each said horizontal brace being tubular and inclined from horizontal the same amount of incline as the adjacent slide surface;

(j) a bore in each flange plate adjacent the connections of said horizontal braces;

(k) a tubular flange connecting each said horizontal brace to each said flange plate; and

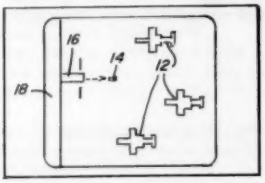
(l) access means extending from the ground to said upper access platform and supported on said plurality of vertical support stanchions.

4,145,043

ANALOG TO DIGITAL VIDEO GAME CONVERSION

William E. Olliges, Barrington Hills, Ill., assignor to Universal Research Laboratories, Inc., Elk Grove Village, Ill.

Filed Dec. 15, 1976, Ser. No. 750,620
Int. Cl.[2] A63F *9/02*
U.S. Cl. 273—1 E **15 Claims**



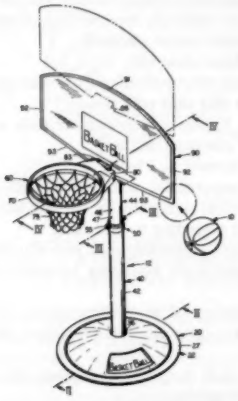
1. An entertainment device which uses a display device capable of providing a visible display in response to electrical signals fed to it, the improvement comprising: means for generating an analog video signal representative of a video picture; means for digitizing said analog video signal; means for generating a digital video signal; said digital signal generating means comprising square wave generating means and a manually controlled image generator coupled to the output of said square wave generating means for modulating the square waves generated by said square wave generating means to provide digital video signals representative of a selected object; gating means; and means for feeding said digitized analog video signal and said digital video signal to said gating means for controlling the visible display on said display device, said gating means comprising a coincidence circuit operable to provide a predetermined output in response to coincidence of said digitized analog video signals and said digital video signals; and means for coupling to said display device said analog video signal and the output of said gating means.

4,145,044

PORTABLE BASKETBALL SET

Lowell T. Wilson, and Herbert A. Plassmann, both of Bryan, Ohio, assignors to The Ohio Art Company, Bryan, Ohio

Filed Mar. 7, 1977, Ser. No. 774,985
Int. Cl.[2] A63B *63/04*
U.S. Cl. 273—1.5 R **12 Claims**



10. A stand for a ball set comprising:
(A) a weighted base having an annular socket, said base comprising: a pair of plastic disc-shaped members, one of which is flat having a central cylindrical upstanding plug portion and the other of which is a spherical segment dome having an axial cylindrical aperture of larger diameter than said plug portion for forming an annular socket between said plug and said aperture, and
(B) a post having a vertical tubular end which seats in said socket.

12. A toy basketball assembly set comprising:
(A) a foam rubber ball, and
(B) a basket stand comprising:
1. a weighted base having an annular socket,
2. telescopic vertical tubes, one end of one of which seats into said socket, at least one of said tubes having a plurality of axially spaced diametrically alignable holes,
3. a pin means for fitting in said diametrically aligned holes for fastening the length of said tubes,
4. a tube cap and ring member capping the other end of said tubes, having a horizontal reinforced ring with a plurality of radially inwardly extending hooks, and having upwardly converging wedge slots in a vertical plane between said cap and said ring,
5. a frusto-conical string net attached at its larger diameter end to said hooks to depend from said ring, and
6. a vertical bounceboard having a trapezoidal notch in its central lower edge for removably fitting into said slots in said cap and ring member.

4,145,045

PRESSURELESS TENNIS BALL

Terence W. Pocklington, Tupelo, Miss., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,988
Int. Cl.[2] A63B *39/00*
U.S. Cl. 273—61 C **10 Claims**

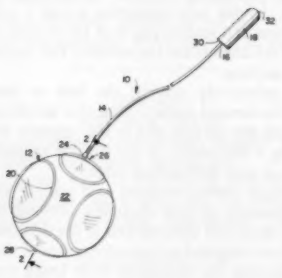
1. A pressureless tennis ball comprising a hollow sphere based on a vulcanized elastomeric composition including from about 10 percent to about 30 percent by weight natural rubber, from about 50 percent to about 80 percent by weight of cis 1,4 polybutadiene, and from about 10 percent to about 30 percent by weight of a copolymer of ethylene and at least one unsaturated monocarboxylic acid containing from three to eight carbon atoms, said copolymer containing up to 30 percent by weight of said acid, said copolymer including a cross linking agent chosen from the group consisting of inorganic and organic metal compounds that allow the metal ions to become associated with the reactive carboxyl groups of said copolymer.

4,145,046

SOCCER TRAINING APPARATUS

Ronald Jones, 1204 Heywood St., N. Vancouver, B.C., Canada (V7L 1H4)

Filed Nov. 18, 1977, Ser. No. 852,826
Int. Cl.[2] A63B *43/02*
U.S. Cl. 273—55 B **7 Claims**



1. A soccer training apparatus comprising a ball, a flexible line, a handle, one end of said line secured to said ball, the other

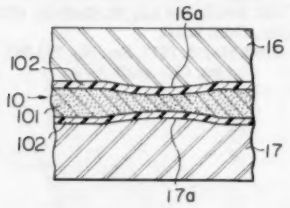
end of said line secured to said handle, means to bias said one end of said line toward the surface of said ball, means to bias said other end of said line toward said handle, means to selectively manually eliminate said means to bias said other end toward said handle and to permit said means to bias said other end of said line to urge said other end of said line toward said handle.

4,145,047

RACKET

Itsushi Nagamoto; Masaharu Kuwabara, and Kunimasa Muroi, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 23, 1977, Ser. No. 799,183
Claims priority, application Japan, May 27, 1976, 51/61632
Int. Cl.[2] A63B *49/10*
U.S. Cl. 273—73 F **10 Claims**



1. An improved racket frame having a head portion defining a playing face, a throat portion, a shaft portion, and a gripping portion, comprising:

said frame including an inner core and an outer envelope encasing said inner core, said outer envelope being formed of a fiber reinforced plastic structure,

said frame in the region of at least said throat portion having a reduced thickness portion including said inner core having a bulge extending into said inner core, said reduced thickness portion being reduced at least in a direction substantially perpendicular to the plane including said playing face,

said reduced thickness portion being located along the path of travel of vibration waves transmitted from said playing face to said gripping portion which are generated upon impact of said playing face,

said reduced thickness portion being operable to change the phase relationship of at least a portion of said transmitted vibration waves to cause wave interference therebetween for dampening said vibration waves as they traverse said path of travel to said gripping portion.

4,145,048

CONCENTRIC BASKETLIKE TARGET GAME

Samuel C. Basil, 1542 E. Willetta, Phoenix, Ariz. 85006

Continuation of Ser. No. 635,371, Nov. 26, 1975, abandoned.
This application Apr. 4, 1977, Ser. No. 784,506
Int. Cl.[2] A63B *63/00, 59/00*
U.S. Cl. 273—95 R **2 Claims**

1. Game apparatus including:

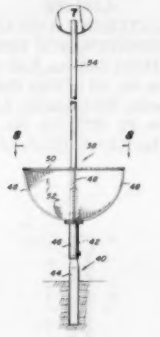
(a) a basketlike target comprising a vertical support

(b) said vertical support comprising a longitudinal tubular portion and a longitudinal flattened portion, said flattened portion facilitating insertion thereof into the ground

(c) said basketlike target further including a tubular frame support in sleeved engagement with the tubular portion of said vertical support and extending longitudinally thereof to a point proximate the flattened portion of the vertical support

(d) a flag including a tubular member inserted into the longitudinal tubular portion of said vertical support and extending downwardly to said flattened portion of the latter

(e) a hoop in spaced, concentric relation to said tubular frame support and disposed in a plane at a right angle to the longitudinal axis of said vertical support and frame support



(f) a plurality of spaced braces, the terminals of which are fixed to said hoop and tubular framed support respectively, and

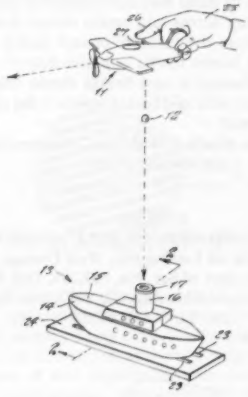
(g) a net suspended from said hoop and hanging between said braces.

4,145,049

BOMBER GAME WITH SPRING APART TARGET

Chris C. Papazian, Sr., 7552 Woodview, Apt. 3, Westland, Mich. 48185

Filed Oct. 17, 1977, Ser. No. 842,732
Int. Cl.[2] A63B *63/04;* A63H *27/00;* F41G *1/42*
U.S. Cl. 273—95 B **4 Claims**



1. A toy game, comprising, in combination, a hand-held unit, a toy target located spaced below said hand-held unit, and a plurality of toy bombs for being released from said hand-held unit, for dropping upon said target; said toy bombs each comprising a spherical ball or marble made of metal, so as to have weight; said target comprising a toy structure having an upwardly extending smokestack, having a central opening therethrough, said toy target comprising right and left side members, held together at the top by a latch mechanism located underneath said smokestack, and held together at the bottom thereof by a keel on an underside of each said member, fitting in one of a pair of parallel grooves formed on a platform, on which said members rest, so that said latch mechanism is released when said toy bomb enters said central opening and strikes said latch mechanism, and a compression coil spring

between said right and left side members spreading said members apart, when said latch mechanism is opened.

4,145,050

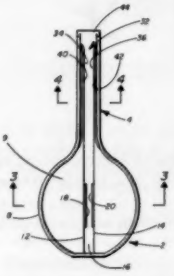
DEVICE FOR CATCHING AND THROWING AN AERODYNAMIC DISC

Richard A. Sullivan; Debra Sullivan, both of P.O. Box 6; Mark Stumboli, 238 Grove St., all of East Rutherford, N.J. 07073, and Kathryn L. Pervin, 708 Sixth St., Lyndhurst, N.J. 07071

Filed Nov. 21, 1977, Ser. No. 853,463

Int. Cl.[2] A63B *65/12*

U.S. Cl. 273—96 R **8 Claims**



1. A device for catching and throwing a disc-shaped object comprising:

a basket means for catching said disc-shaped object;

a means attached to said basket means for throwing said disc-shaped object, said throwing means comprising a narrow, elongated, arcuate channel open at one end thereof to said basket means, said channel diminishing in height toward its distal end, said channel in said throwing means extending across said basket means along the bottom thereof from the juncture of said basket means and said throwing means to the opposite side of said basket means, said channel in said basket means being in open communication with said basket means at the upper end of said channel; and

a grasping means attached to said basket means for catching and throwing a disc-shaped object.

4,145,051

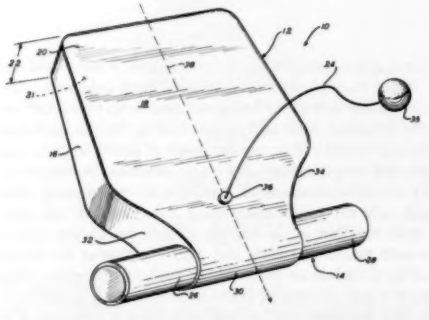
RACQUET AND RETURN BALL APPARATUS

Jerrold J. Krumholz, 66 Lessing Rd., West Orange, N.J. 07052

Continuation-in-part of Ser. No. 729,254, Oct. 4, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,322

Int. Cl.[2] A63B *67/10*

U.S. Cl. 273—97 R **10 Claims**



1. An improved racquet and return ball apparatus comprising in combination:

a paddle portion including ball striking surfaces on each face thereof;

a handle means secured toward one side of said paddle portion, and including a pair of grasping portions extending in generally opposed directions, each said grasping portion extending transversely to the longitudinal axis of said paddle portion, and beyond the perimeter of said paddle to enable grasping of each or both said portions by the user of said apparatus; and

a resilient ball being secured to one face of said paddle portion by an elastic tethering line, to enable the user of said racquet to displace said ball to and fro from said racquet by periodically impacting said ball on one or another of said striking surfaces.

4,145,052

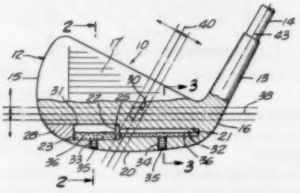
GOLFING IRON WITH WEIGHT ADJUSTMENT

Robert L. Janssen, 900 S. 6th Ave., Space 246, Hacienda Heights, Calif. 91450, and Lee M. Bucholz, 10230 Hopeland Ave., Downey, Calif. 90241

Filed May 3, 1977, Ser. No. 793,383

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—171 **9 Claims**



1. In an iron-type golf club;

a metal head having a heel, a toe, a thickened lower portion and a striking face for a golf ball;

said head having a pair of axially aligned elongated chambers respectively disposed in the toe and heel half portions of the thickened lower portion and having threaded apertures in the bottom of said thickened lower portion leading to each of said elongated chambers;

a threaded closure member fitted within each of said apertures; and

a metal powder having a density substantially greater than the density of the head metal carried in each of the chambers;

whereby the center of mass of the head may be shifted about a working zone by introducing into or withdrawing from said chambers varying amounts of said metal powder.

4,145,053

GOLF COURSE

Gerald P. Healey, 1265 Wednesbury Cir., Akron, Ohio 44313

Division of Ser. No. 561,280, Mar. 24, 1975, Pat. No. 4,019,748, which is a continuation-in-part of Ser. No. 451,455, Mar. 15, 1974, abandoned. This application Mar. 3, 1977, Ser. No. 773,802

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—176 AB **9 Claims**

1. A golf course, comprising:

(A) an elongate first hole having

(1) at least one primary teeing area located adjacent one end thereof,

(2) a plurality of graded target areas located adjacent the opposed end thereof, and

(3) a clearly discernible fairway interconnecting said teeing area and said target areas;

(B) an elongate second hole

(1) disposed parallel to and closely adjacent said first hole and extending along a parallel axis and having

(a) at least one primary teeing area located adjacent one end thereof and opposite said target areas of said first hole,

(b) a plurality of graded target areas located adjacent the opposed end thereof and opposite the fairway of said first hole; and

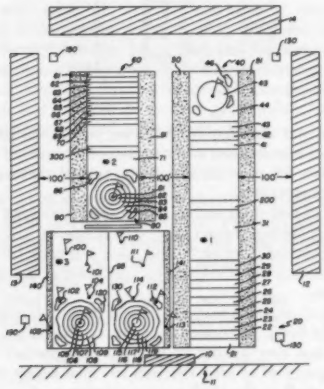
(c) a clearly discernible fairway interconnecting said teeing area and target areas with said second hole

(C) an elongate third hole

(1) disposed parallel to and closely adjacent said first hole and coextensively with and closely adjacent said second hole and having

(a) a clearly discernible fairway extending coextensively from said second hole and

(b) at least one target area disposed opposite said primary teeing area of said first hole;



(D) the length of said first hole being 300 yards and the combined length of said second and third holes being substantially equal to the length of said first hole;

(E) rough areas disposed along the longitudinal edges of said first, second and third holes and forming a continuous boundary between said first hole and said second and third holes;

(F) said fairway of said third hole being divided into two parallel sub-fairways, with one target area being provided for each said sub-fairway in parallel relationship with each other; and

(G) said target areas of said third hole being divided into a plurality of radially directed segments of substantially equal area and being provided with concentric graded scoring zones.

4,145,054

GOLF SWING TRAINING AID

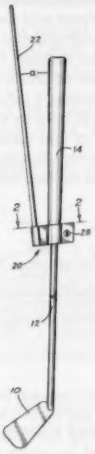
Phil D. Stewart, 2204 Bryson Rd., Boise, Id. 83702

Filed Jun. 17, 1977, Ser. No. 807,379
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 A **3 Claims**

1. In combination with a golf club having a golf head and a shaft extending from the golf head for gripping in the hands of a golfer, a golf swing training aid comprising:

a. an elongated rod, and

b. attaching means for attaching the rod to the golf club shaft for disposition of the rod ends in a plane extending through the shaft and golf head and for extension of the rod rearwardly over the hands of the golfer beyond the end of said shaft and for termination of the rod at its rearward end in a position between and out of contact with the forearms of the golfer during the back swing, down swing and follow through of a properly executed



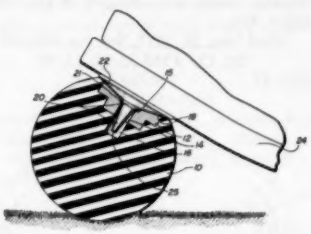
golf swing and for contact with the forearms of the golfer during an improperly executed golf swing.

4,145,055

GOLF TRAINING DEVICE

John P. O'Brien, 175 E. Delaware Pl., Chicago, Ill. 60611

Continuation-in-part of Ser. No. 661,779, Feb. 26, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,293
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—187 B **4 Claims**



1. A golf training device adapted to be removably affixed to a golf shoe, said training device comprising a support member, said support member being substantially spherical with a diameter from 1.6 to 1.75 inches, an annular magnet mounted on the upper surface of said support member, said annular magnet having an upper surface complementary to the flange of a standard golf spike, and an axial opening adapted to receive the shank of a standard golf spike.

4,145,056

RECORD CATCHER

Robert D. Newcomb, Glendale, Calif., assignor to Newcomb Audio Products Co., Sylmar, Calif.

Continuation of Ser. No. 598,694, Jul. 24, 1975, abandoned. This application Feb. 13, 1978, Ser. No. 877,114
Int. Cl.[2] G11B *3/62*
U.S. Cl. 274—10 S **3 Claims**

1. A unitary record adapter for a record disc that has a relatively large diameter 45 rpm hole;

a. said adapter having a generally cylindrical base portion adapted to register with the hole of said record disc;

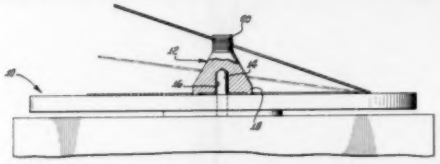
b. said base portion having a lower surface at which a down-

wardly facing recess opens adapted to register with and fit a relatively small diameter or 33 rpm turntable spindle;

c. said adapter having a substantially conical central portion extending upwardly from said base portion to guide said record into registry with said cylindrical base portion, said conical central portion defining the location of an imaginary apex at the center of said conical central portion;

d. said conical portion having a substantial angularity where it joins said cylindrical base to ensure that gravity completes the movement of said record onto said base;

e. said conical central portion having an integral extension or tip peripherally joined thereto and extending a significant



distance above and beyond said imaginary apex for catching the record when the record bounces or slides to stop the record from moving laterally entirely out of registry with said adapter and to cause the record to return to registry with said cylindrical base portion, the peripheral profile of said adapter being continuous and free of any upwardly facing shoulder that would restrain downward movement of said record disc; and

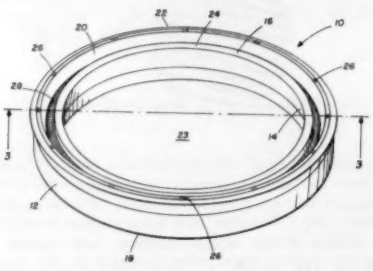
f. said extension or tip having a diameter relatively small compared to said large diameter hole in order to avoid interference while the record centers itself as it drops over said central conical portion.

4,145,057

PACKING MEMBER

John H. Wheeler, Dallas, Tex., assignor to The Texacone Company, Dallas, Tex.

Filed Nov. 28, 1977, Ser. No. 855,154
Int. Cl.[2] F16J *15/32, 15/40*
U.S. Cl. 277—27 **10 Claims**



1. A packing member comprising:

an annular body having a circular outer wall and a circular inner wall, with first and second end walls extending between the inner and outer walls;

said annular body having a groove with inner and outer groove walls extending axially into the body through the first end wall;

the inner and outer walls of said body including inner and outer sealing lips, respectively, formed therein adjacent to at least a portion of the groove; and

a resilient, circular member engaging one of the groove walls for applying a radially directed force to one of the sealing lips;

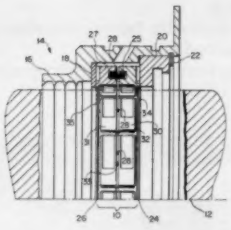
said annular body including a plurality of spaced apart openings extending axially into the first end wall thereof between the other groove wall and the other sealing lip.

4,145,058

SHAFT SEAL ASSEMBLY FOR HIGH SPEED AND HIGH PRESSURE APPLICATIONS

William F. Hady, Cleveland Heights, and Lawrence P. Ludwig, Fairview Park, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 8, 1977, Ser. No. 814,006
Int. Cl.[2] F16J *15/16*
U.S. Cl. 277—62 **13 Claims**



1. In a seal assembly for reducing the escape of fluids from between a housing and a shaft rotatively mounted in the housing, means for providing stability against thermally induced seizure comprising

a pair of seal rings within said housing mounted on the shaft for rubbbing contact therewith in side-by-side relationship and spaced from each other, said seal rings being normally stationary with respect to said housing as said shaft rotates,

a pair of opposed seating surfaces on said housing, said seal rings being positioned between said seating surfaces,

each seal ring having an internal bore surface including a plurality of spaced recesses for channeling fluid toward the shaft as the shaft rotates relative to the seal assembly thereby generating lift to maintain each seal ring spaced from said rotating shaft whereby said ring slips relative to said shaft and remains stationary with respect to said housing,

said seal rings further comprising oppositely facing radial faces located adjacent to said seating surfaces of the housing and including a plurality of spaced recesses for channeling fluid toward the seating surfaces to generate lift as said seal rings rotate relative to said housing when said seal assembly seizes said shaft due to thermal expansion thereof into engagement with said internal bore, and

spring means between said seal rings for biasing said oppositely facing radial faces into sealing engagement with said seating surfaces of said housing when said seal rings are stationary relative to said housing and resiliently securing said seal rings to each other thereby providing uniform rotation relative to said housing when said seal rings seize said shaft and substantially equal stoppage of said rotation resulting from thermal contraction of said shaft upon cooling the same.

4,145,059

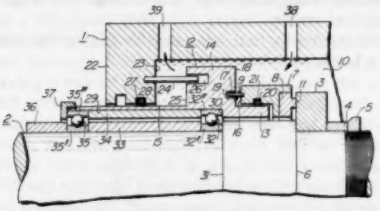
MECHANICAL SEAL

Masaya Imai, Ibaraki, and Seiji Watanabe, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 26, 1976, Ser. No. 745,060
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—81 R **1 Claim**

1. In a mechanical seal including a rotating seal element mounted on a rotating shaft in a casing for rotation therewith, a stationary seal element provided with a seal ring which is in contact with said rotating seal element and providing sliding seal faces in between, and a support ring supporting said stationary seal element thereon, allowing the latter to move only in the axial direction, the improvement comprising means for

securing said support ring to said rotating shaft in such a manner that, between said casing and said shaft, said ring is not rotatable by said shaft, but can travel axially following any axial movement of said shaft, and wherein said support ring is provided with an intermediate large diameter portion having a diameter slightly smaller than that of the inner axial surface of



the casing, said means for securing said support ring to said rotating shaft in the manner set forth comprising nonrotational stop means located between said casing and support ring, said inner axial surface slidably guiding said large diameter portion of the support ring and a thrust sliding bearing mounted on said rotating shaft and fitted in an annular groove formed on the inner peripheral surface of said support ring.

4,145,060

AXIALLY AND RADIALLY CLAMPING SPREADER RING FOR AN OIL SCRAPING PISTON RING

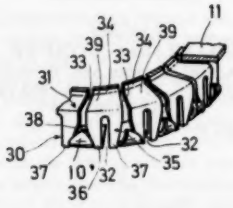
Friedhelm Stecher; Martin Morsbach, and Paul Johren, all of Burscheid, Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Dec. 17, 1976, Ser. No. 751,893

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557721

Int. Cl.² F16J *9/20, 15/16*

U.S. Cl. 277—139 **8 Claims**



1. An axially and radially clamping spreader ring for an oil scraper piston ring, for installation in a groove in a piston which is mounted in a cylinder and which piston has oil discharge bores, comprising a profiled and metal band which has been made resilient in the circumferential direction, its two ends abutting against one another, the metal band being provided in the area of its upper side with axial and radial supporting faces to accommodate at least one band-shaped scraper ring, a plurality of radially outwardly extending protrusions distributed over the circumference of the lower side of the spreader ring, said protrusions being separated from one another by wide lubricating channels, said protrusions acting as supporting bars which slide on the cylinder wall when installed in a piston and absorbing torque resulting from the structural configuration of the spreader ring so that the spreader ring can no longer be twisted, with said lubricating channels, in conjunction with the oil discharge bores in the piston, providing lubrication through the spreader ring and cooling the spreader ring and the scraping ring when installed in a piston, the metal band having an approximately U-shaped cross-sectional profile and containing individual metal band sections which are separated from each other by axial cuts, the radial protrusions comprising partially stamped-out raised and rounded portions of each individual metal band section, said rounded portions being peaks which are rounded toward the cylinder wall.

4,145,061

CLAMPING DEVICE FOR A DENTAL TOOL

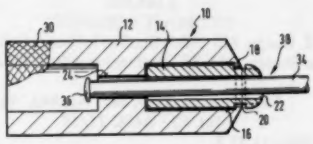
Hans K. Schneider, Ebrach 209, Ebrach, Fed. Rep. of Germany (8091)

Filed Oct. 11, 1977, Ser. No. 840,894

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650864

Int. Cl.² B23B *5/22, 5/34, 31/10*

U.S. Cl. 279—96 **12 Claims**



1. A clamping device comprising

(a) an elongated body member formed with a first, longitudinal bore; and

(b) an elongated tubular sleeve member formed with a second bore therethrough,

(1) said sleeve member being secured in said first bore for angular movement about an axis between two relative positions,

(2) respective portions of said bores constituting axially consecutive parts of a continuous receptacle in each of said positions,

(3) said portions of said bores being substantially aligned in one of said positions and offset transversely of said axis in the other position,

(4) said sleeve member projecting axially from said first bore, the projecting part of said sleeve member being of non-circular cross-section at right angles to said axis.

4,145,062

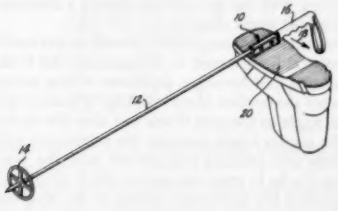
SNOW SCRAPER

Cyrus R. Stiemert, 4451 145th Ave., SE., Bellevue, Wash. 98006

Filed Dec. 1, 1976, Ser. No. 746,404

Int. Cl.² A63C *11/22;* **A47L** *23/04*

U.S. Cl. 280—11.37 E **6 Claims**



1. A snow scraper for attachment to a ski pole shaft comprising:

a unitary elongated member having a wall, said wall defining an elongated channel through said member oriented longitudinally along said member, said channel being substantially cylindrical so as to circumscribe said ski pole shaft, said member having at least one longitudinally oriented, straight scraping edge formed by first and second intersecting exterior surface portions of said wall, said first surface portion being substantially planar and being oriented substantially parallel to a tangent to said channel and being spaced outwardly from said channel, said wall having a longitudinal slot therein extending from said

channel to the plane of said first surface portion, said edge being laterally offset from said slot, said wall having a concave exterior surface portion adjacent said edge, said concave surface portion being located in said wall between said first surface portion and said channel and intersecting said second surface portion, and

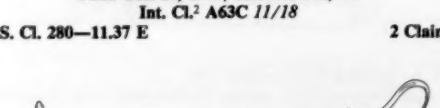
attachment means for securing said member to a ski pole shaft by decreasing the width of said slot and thereby reducing the diametric dimension of said channel to place the surface of said channel in intimate contact with said ski pole shaft, said attachment means being located between the plane of said first surface portion and said channel.

4,145,063

SKI BOOT SCRAPER

Gregory T. Knapp, 833 Videll St., San Lorenzo, Calif. 94580, and Gordon Haney, 111 W. Bastanchury Rd., Fullerton, Calif. 92635

Filed Oct. 17, 1977, Ser. No. 842,744
Int. Cl.[2] A63C *11/18*
U.S. Cl. 280—11.37 E **2 Claims**



1. A ski boot scraper for use with a ski pole and comprising:

a. an elongated body arcuate in cross section with a pair of longitudinally extending edges spaced from each other a distance slightly less than the diameter of the ski pole shank to which the boot scraper is removably secured, the sides of the body yieldingly gripping the shank for preventing the accidental removal of said body from the shank;

b. the two longitudinal edges being usable as snow scrapers when the body is removed from the ski pole shank and one end of said body being tapered to provide a handle portion having an arcuate cross section of less than half a circle;

c. whereby said handle portion will encircle the ski pole shank less than one-half circle and therefore may be more readily grasped for swinging said body free from the shank;

d. an anchor block secured to the ski pole shank adjacent to the ski pole handle and having an annular inner groove facing toward the pole shank with an opening communicating with the groove and having a diameter larger than the pole shank diameter;

e. said ski boot scraper body having an outwardly extending integral lip disposed at the opposite end from said handle portion and having a thickness which permits the lip to enter the anchor block opening when the body is held at an angle to the pole shank and then the lip is inserted into the anchor block opening, the subsequent swinging of the body into yielding engagement with the pole shank causing the lip to enter the anchor block annular groove and to prevent the accidental sliding of the body along the pole shank.

4,145,064

SLED-TYPE VEHICLES

Patrick Carn, Rte. de Benodet, Quimper, France

Filed Jun. 24, 1976, Ser. No. 699,500
Claims priority, application France, Jun. 26, 1975, 75 21293; Jun. 14, 1976, 76 18011
Int. Cl.[2] B62D *9/02*
U.S. Cl. 280—87.01 **18 Claims**

1. A sled type vehicle for descending over unimproved ground, and particularly grass or snow covered slopes, characterized by

a chassis having wheels, an occupant support for the driver, and lateral longitudinal struts paralleling its longitudinal axis,

the chassis being provided with two wheels positioned near the transverse ends of the chassis, front and back, the center plane of the wheels coinciding normally with the longitudinal axis of the chassis,

the wheels being wider than they are high and of generally elliptical profile,

at least the front wheel being capable of pivoting angularly in a horizontal plane,

the axle of the orientable front wheel resting at its ends upon a bearing formed by the longitudinal struts,

each axle end of the wheel being maintained in contact with a longitudinal strut by means of elastic members forming a traction spring between the end of the wheel axle and the corresponding longitudinal strut of the chassis,

each end of the wheel axle being displaceable along the corresponding longitudinal strut against the action of the elastic members forming the spring.

4,145,065

ROLLER SKATE SCOOTER

Rudolph J. Kupka, 9101 Sheridan Ave., Brookfield, Ill. 60513

Filed Jun. 3, 1977, Ser. No. 803,134
Int. Cl.[2] B62B *7/04*
U.S. Cl. 280—87.04 R **13 Claims**

1. A foot-propelled scooter, comprising:

an articulated support platform for supporting the weight of a child, said articulated support platform being of a width slightly larger than the width of a child's foot and including a first elongated front footboard having a rearward end and a second elongated rearward footboard having a front end and normally positioned in longitudinal alignment with and rearward of said front footboard, and coupling means pivotally connecting said front and rearward footboards generally in an end-to-end array and defining a pivot point;

said coupling means including a forward turning plate and a rearward turning plate positioned in generally horizontal alignment with each other and pivotally connected to each other, said forward turning plate having a hollow

front head spaced forwardly of said rearward turning plate for snugly receiving the rearward end of said front footboard and said rearward turning plate having a hollow rearward head spaced rearward of said hollow front head for snugly receiving the front end of said rearward footboard, one of said turning plates being generally U-shaped in cross-section as viewed longitudinally and having a bifurcated slide plate extending between and positioned in general horizontal alignment with said forward and rearward hollow heads, said bifurcated slide plate having a pair of generally horizontal arms, the other of said turning plates having a general horizontal tongue slidably positioned between said arms and extending between said forward and rearward hollow heads, said tongue being positioned in general horizontal alignment with said rearward footboard and said forward footboard, and coupling pin means spaced between the forward and rearward footboards for pivotally connecting said arms to said tongue, said coupling pin means extending below the level of said rearward footboard and defining said pivot point;

wheel means secured to the underside of said articulated support platform and spaced from said coupling means, said wheel means including at least one wheel secured to the underside of said front footboard and at least one wheel secured to the underside of said rearward footboard; and steering means operatively connected to said front footboard for remotely and arcuately maneuvering said front footboard generally in a horizontal plane about said pivot point, said steering means including a generally upright cab having storage means, said storage means including a plurality of vertically spaced shelves defining storage compartments for carrying objects and a top generally covering said storage compartments, each of said shelves having a rearward upright abutment plate for preventing the objects carried on said shelves from falling off during acceleration and deceleration of said scooter; and

illuminating means including first and second generally red reflectors secured to one of said rearward upright abutment plates on opposite sides of said articulated support platform, said red reflectors facing generally rearwardly and being positioned at a location in which no more than one of said red reflectors is optically blocked by the child during propulsion of said scooter, at least one white reflector secured to the front of said cab and facing generally forward, a battery-powered illuminating lamp secured to and positioned above the top of said cab, and at least one battery connected to said illuminating lamp and seated on one of said storage compartments adjacent one of said rearward upright abutment plates.

4,145,066

EMERGENCY EXIT STEP FOR SCHOOL BUS

Nadeane P. Shearin, 560 Hillview Dr., Lebanon, Oreg. 97355

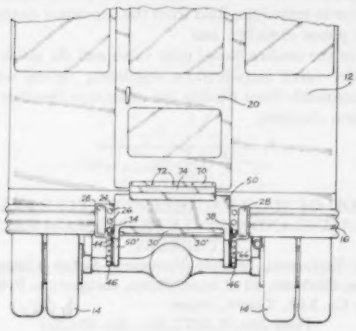
Filed Oct. 11, 1977, Ser. No. 840,579
Int. Cl.[2] B60R *3/02*
U.S. Cl. 280—166 **11 Claims**

1. For use with a vehicle body having an exit opening and door removably closing said exit opening, a step assembly comprising;

a. a step member,

b. pivot means for mounting the step member on the vehicle in registry with the exit opening in the body thereof for movement independently of the door between an operative position extending horizontally outward of the vehicle body below the exit opening therein and a retracted position extending vertically upward adjacent the vehicle body, and

c. a catch member adapted to be secured to the door associated with the exit opening in the vehicle body and arranged, when the door is closed, to overlap the retracted step member and secure the latter in said retracted position and arranged, when the door is open, to allow the step member to pivot to said operative position.

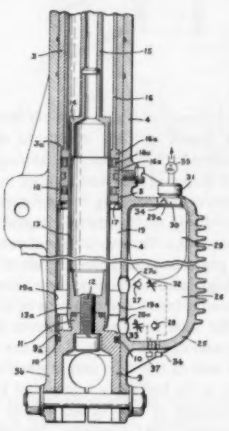


4,145,067

SUSPENSION SYSTEM FOR A MOTOR VEHICLE

Enrico Ceriani, Samarate, Italy, assignor to ARCES S.r.l., Samarata (VA), Italy

Filed Jul. 1, 1976, Ser. No. 701,957
Claims priority, application Italy, Jul. 2, 1975, 25026 A/75
Int. Cl.[2] B62K *25/08*
U.S. Cl. 280—276 **10 Claims**



1. A suspension system for a wheel driven, frame mounted, motor vehicle comprising:

a pair of interconnected rigid bodies connected between the wheel and the frame, the inner body telescoping into the outer body;

a piston formed at the lower end of the inner body;

a piston chamber formed in the outer body below the piston;

a connecting body having an expansion chamber formed therein connected to the outer body;

a deformable envelope disposed in the expansion chamber filled with compressible fluid under pre-determined pressure;

hydraulic fluid filling the piston chamber and the expansion chamber;

first valve means connected to communicate hydraulic fluid between the piston chamber and the expansion chamber responsive to piston movement whereby the deformable envelope will be compressed wherein;

the first valve means includes at least one unidirectional inlet valve to deliver fluid from the piston chamber to the expansion chamber and at least one unidirectional outlet valve to return the fluid from the expansion chamber into the piston chamber; and

each of the unidirectional inlet valve and the unidirectional outlet valve include flow regulating valves which are controllable from outside the expansion chamber and the piston chamber.

4,145,068

METHOD OF MANUFACTURING BICYCLE FRAME BY DIE CASTING AND BICYCLE FRAME MANUFACTURED THEREBY

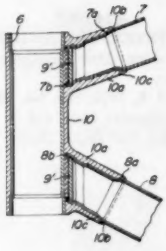
Takeshi Toyomasu; Michito Furusawa; Sadao Mabuchi, and Mitsuo Gushima, all of Ageo, Japan, assignors to Bridgestone Cycle Co. Ltd., Tokyo, Japan

Filed Jun. 8, 1977, Ser. No. 804,531

Claims priority, application Japan, Jun. 18, 1976, 51-80027[U]

Int. Cl.[2] B62K *3/04, 19/12*

U.S. Cl. 280—281 R **2 Claims**



1. A method of manufacturing a bicycle frame consisting of tubes previously closed at their ends and die-cast lugs for connecting said tubes, including steps of arranging said tubes in position in a final frame in dies and forcing molten metal into cavities of said dies corresponding in configuration to said lugs to form said lugs by said molten metal integrally including said closed ends of said tubes, the improvement comprising steps of forming tapered portions at said closed ends of the tubes before die casting said lugs, said tapered portion extending from that corresponding to an extreme end of a boss of said lug surrounding the end of the tube toward an extreme end of the tube, closing each said end of said tube by a closure member oblique to a longitudinal axis of the tube and in parallel with an outer surface of a tube to be buttingly connected to said tube, and forming outer surfaces of said bosses of the die-cast lugs in substantially constant outer diameter, thereby progressively reducing thicknesses of walls of the bosses at their extreme ends along said tapered portions of said tubes, maintaining necessary and sufficient thickness of said lugs.

4,145,069

SUPPORT SYSTEM FOR A WHEELED VEHICLE

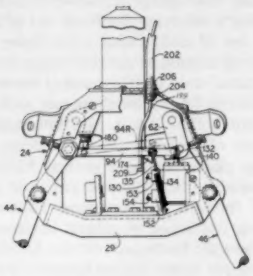
Russell P. Kissick, 391 Greenwell Rd., Cincinnati, Ohio 45238

Filed Jun. 6, 1977, Ser. No. 803,949

Int. Cl.[2] B62H *1/02*

U.S. Cl. 280—303 **8 Claims**

1. A support system for a wheeled vehicle which comprises a housing mounted on the vehicle, a pair of support arms pivotally mounted on the housing, means mounted on the support arms for engaging a supporting surface, a crank arm attached to each support arm, an actuator advanceable transversely of the pivots of the support arms, means linking the crank arms to the actuator, and means for releasably connecting pivots between the linking means and the crank arms to prevent relative movement of said pivots which when released



move relative to one another with the crank arms to hold the support arms in a vehicle supporting position.

4,145,070

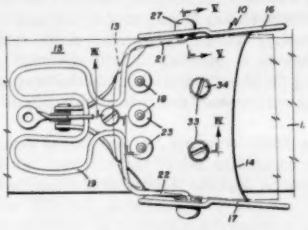
SKI BINDING

Henry P. Berlied, Jr., West Concord, Mass., assignor to Doure Ski Binding Company, West Concord, Mass.

Filed Oct. 25, 1977, Ser. No. 844,784

Int. Cl.[2] A63C *9/20*

U.S. Cl. 280—615 **3 Claims**



1. Cross-country ski binding for fixing the toe of a boot to a ski, comprising:

(a) a sheet metal base plate adapted to be fixed to the upper horizontal surface of the ski, the plate having integral flanges extending vertically on either side for engaging the sides of the boot,

(b) a plurality of hollow pins extending upwardly from the plate for engaging suitable apertures in the boot, each pin being integral with the plate, an upwardly-directed boss being provided on the base plate and said pin being integral with the boss, the boss having a flat upper surface extending outwardly a substantial distance from the pin,

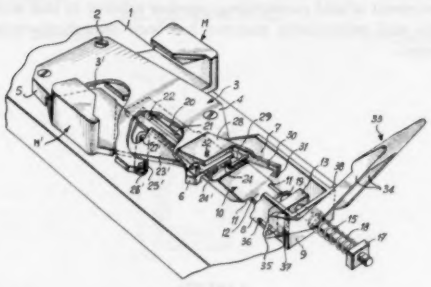
(c) a clamping means in the form of a generally U-shaped bail, the legs of the bail being pivotally engaged with the side flanges, an end of each leg of the bail extending through an aperture in its respective flange and being provided with a protuberance on the outside of the flange to inhibit withdrawal,

(d) a cap attached to the outer surface of each flange and having hollow interior in which the outer end of the bail and its protuberance resides and wherein a washer lies on the inner surface of each flange and has an aperture through which the end of the bail extends, the cap having integral fingers that extend through the aperture in the flange, through the aperture in the washer, and are bent laterally on the inside surface of the washer to lie against the surface of the washer and lock the cap, flange, and washer together.

4,145,071
SAFETY BINDING FOR SKI-BOOT WITH AUTOMATIC REFITTING

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Oct. 20, 1976, Ser. No. 734,331
Claims priority, application France, Nov. 26, 1975, 75 36185
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—624 30 Claims



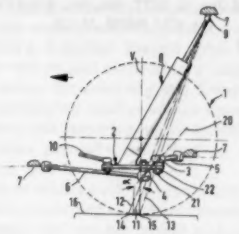
1. A safety binding to hold a boot to a ski and comprising:
(a) a baseplate secured to the ski;
(b) two jaws adapted to move in relation to said baseplate and arranged symmetrically on each side of the longitudinal axis of the ski, said jaws being designed to cooperate with the sides of the boot and being displaceable in the plane of the ski;
(c) a resilient means mounted on said baseplate and including
(i) a slide element mounted to move in translation in said baseplate and to cooperate with said jaws, in such a manner that the displacement of said slide corresponds to the opening or closing of said jaws; and
(ii) a spring means associated with the slide element and tending to retain the latter in a position corresponding to the closed jaws, the displacement of said slide occurring against the action of said spring means, said slide being adapted to move between a first position corresponding to the closing of said jaws and a second position corresponding to the opening thereof; and
(d) a lock means on said baseplate engaging one of the elements of said resilient means when said slide is in its second position.

4,145,072
INDEPENDENT SUSPENSION OF A STEERED WHEEL OF A MOTOR VEHICLE

Wolfgang Matschinsky, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,741
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614285
Int. Cl.[2] B60G 11/58
U.S. Cl. 280—668 11 Claims

1. An independent suspension of a steered wheel of a motor vehicle, comprising wheel carrier means, two lower wheel guide means pivotally connected with the wheel carrier means in its lower area by lower joint means arranged one behind the other in the longitudinal direction of the vehicle, and upper guide means having at least one upper joint means for guiding the wheel during the spring and steering movements thereof, the ideal steering axis of the wheel which is represented by the line of intersection of the planes that are defined by the longitudinal axes of the two lower guide means and the upper joint means being inclined with respect to the vertical, as viewed in side view of the vehicle, for purposes of obtaining a castor angle, characterized in that the two lower joint means are so arranged at different heights that, as viewed in side view of the vehicle, the connecting line of these joint means is inclined

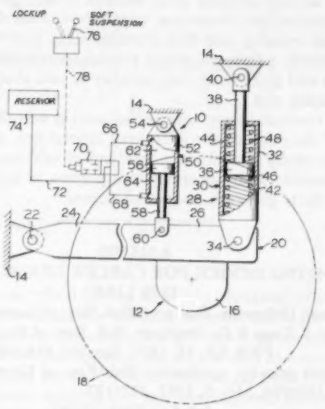


with respect to the vertical in the same sense as the ideal steering axis.

4,145,073
LOCKUP SYSTEM FOR A VEHICLE SUSPENSION MECHANISM

Walter L. McLuckie, Coal City, and Herschel M. Williamson, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 7, 1977, Ser. No. 785,626
Int. Cl.[2] B60G 3/14
U.S. Cl. 280—702 5 Claims

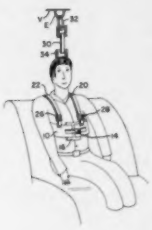


1. In a lockup system for a vehicle suspension mechanism of the type having a frame; an axle assembly having a ground engaging wheel thereon; a radius arm pivotally connected to the frame and supporting the axle assembly and wheel; and resilient suspension means connected to the frame and one of the arm and axle assembly for cushioning oscillatory movement of the arm as the wheel traverses irregular terrain; the improvement comprising:
a lockup suspension strut having first and second reciprocally connected members defining first and second chambers therebetween, said first and second members connected individually to one of the frame and the axle assembly; and
control means having a first condition for communicating a fluid to and from said chambers for telescoping said first and second members simultaneously with the independent cushioning action of said resilient suspension means, and having a second condition for blocking fluid communication to said chambers and maintaining a substantially rigid holding position of the frame and the arm.

4,145,074
AUTOMOTIVE BODY HARNESS

Fred M. Hendricks, Rte. 2, Eastway Dr., Dallas, N.C. 28034

Filed Jun. 6, 1977, Ser. No. 803,627
Int. Cl.[2] B60R 21/10
U.S. Cl. 280—744 13 Claims

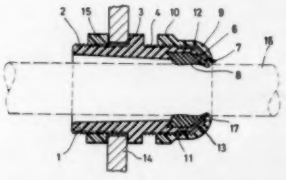


1. An improved harness assembly for use in automotive vehicles comprising:
   a. a girth encircling member, said member having a substantial width dimension, said member further having a resilient surface along at least a portion of the inside and top surfaces of the member resideable below the arms of a wearer of same, said member having member coupling means at the ends and strap securement means adjacent the ends thereof;
   b. a first shoulder strap secured to said girth encircling member and extending angularly outwardly therefrom;
   c. a second shoulder strap secured to said girth encircling member and extending angularly outwardly therefrom and crossing said first shoulder strap and being secured thereat, a free end of said shoulder straps being securable to said girth encircling member at said strap securement means; and
   d. a vertical support member secured to said shoulder straps at the point of shoulder strap intersection and extending upwardly therefrom, a free end of said vertical support member being securable to a portion of said automotive vehicle generally above the wearer.

4,145,075
CLAMPING DEVICE FOR CABLES, LEADS, HOSES OR THE LIKE

Hermann Holzmann, Stuttgart, Fed. Rep. of Germany, assignor to U. I. Lapp K.G., Stuttgart, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,855
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2631996; May 5, 1977, 2720137
Int. Cl.[2] F16L 19/00
U.S. Cl. 285—81 8 Claims

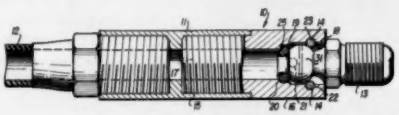


1. A clamping device for positively anchoring cables, leads, hoses and the like, comprising a hollow cylindrical mounting socket for receiving therethrough a cable to be clamped, a plurality of clamping tongues formed integrally and peripherally at one end of said socket and having free ends, an annular gasket peripherally enclosed by the clamping tongues, said socket having an external screw threaded portion adjacent to said one end thereof, an internally screw threaded pressurizing member threaded onto said external screw threaded portion of said socket, said pressurizing member having an annular cam surface extending radially inwardly at an inner end thereof for engaging and deforming said tongues as said pressurizing member is threaded onto said socket to press said gasket against the cable to clamp the cable with respect to the socket, said cam surface of said pressurizing member being formed with a longitudinally extending step for positively engaging a longitudinal edge of an overlapping clamping tongue to inhibit rotary movement of said pressurizing member relative to said socket after said pressurizing member has been assembled on said socket.

4,145,076
CONNECTING MEMBER FOR LUBRICATION SYSTEM

John P. Snow, Sagamore Hills, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Continuation of Ser. No. 668,240, Mar. 18, 1976. This application Aug. 26, 1977, Ser. No. 828,104
Int. Cl.[2] F16L 21/04
U.S. Cl. 285—94 18 Claims



1. A coupling for a lubricating device comprising (a) a lubricant-receiving fitting having an enlarged head portion, a shoulder longitudinally spaced therefrom and an intermediate portion of smaller cross-section than the head and the shoulder disposed between said head and shoulder, (b) a source of lubricant terminating in a threaded end portion, (c) a tubular member having a body portion, a threaded end portion and an opposite end, said threaded end portions having longitudinally extending bores, (d) a threaded sleeve connecting the said threaded end portions together with their bores communicating with each other, said body portion having a first counterbore extending longitudinally inwardly from said opposite end of said tubular member, the longitudinal dimension of the said first counterbore being about equal to the longitudinal dimension of said head and said intermediate portion of the fitting, a second counterbore between the first counterbore and the bore in the threaded end portion of the tubular member, an O-ring disposed in the second counterbore, the head and intermediate portions of said fitting being disposed in the first counterbore with the head pressing the O-ring in said second counterbore against the shoulder formed by the juncture of the second counterbore with the bore in the tubular member, and with the said shoulder of the fitting pressing against said opposite end of the tubular member, a pair of holes through the tubular member having portions of their cross-sections through the first counterbore disposed on opposite sides of the head of the fitting on that side thereof facing said intermediate portion and a clip having its legs inserted through said holes and abutting the head of the fitting thereby holding the fitting in the first counterbore in a position where the said O-ring is compressed and said shoulder of the fitting is pressed against said opposite end of the tubular member.

4,145,077

BUMPER COVERING FOR MOTOR VEHICLES

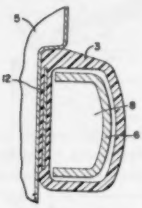
Fritz Haberle; Daniel Riechers, both of Sindelfingen, and Alfred Hochrathner, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 547,164, Feb. 5, 1975, abandoned. This application May 2, 1977, Ser. No. 792,555

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1974, 2405562

Int. Cl.[2] B60R *19/02*

U.S. Cl. 293—102 25 Claims



1. In a bumper-covering for a motor vehicle having a body structure and a bumper member separated from said body structure by an upper gap, said bumper member having a central portion extending transversely with respect to the motor vehicle and ends which extend longitudinally with respect to said motor vehicle, the improvement comprising said bumper-covering including a strip means securely connected with said body structure for bridging said upper gap between said body structure and said bumper member, and pocket-shaped means integrally formed with each end of said strip means for covering at least a portion of the bumper ends, said strip means and said pocket-shaped means being at least partially constituted of soft-elastic material, wherein said pocket means completely encircles said portion of said bumper ends with clearance for enabling said bumper ends to be telescopingly displaced within said pocket means without engaging the vehicle body structure.

4,145,078

LOADING AND UNLOADING STATION FOR CONVEYORS WITH OVERHEAD TROLLEY DRIVES

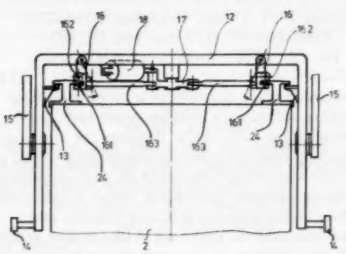
Klaus Vetter, and Rudolf Heber, both of Rastatt, Fed. Rep. of Germany, assignors to Stierlen-Maquet Aktiengesellschaft, Rastatt, Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,079

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603739

Int. Cl.[2] B66C *1/62, 1/00*

U.S. Cl. 294—67 DA 4 Claims



1. A loading and unloading station transporter for conveyors with overhead trolley drives and automatic feeder and withdrawal devices for transporting containers for goods to be transported, which includes:

a suspension arrangement for receiving one of said containers; and

centering means pivotally and rotatably connected to said suspension arrangement for centering and fixing said container in said suspension arrangement, each of said containers having I-shaped flanged grab rails connected thereto for use by said suspension arrangement and said centering means for receiving and fixing said container, said grab rails having notches in their upper inside flanges; and in which said centering means includes:

positioning arms pivotally connected to said suspension arrangement; and

centering rollers which have a vertical axis and which are connected to said positioning arms, said centering rollers being operable to engage said notches of said grab rail flanges.

4,145,079

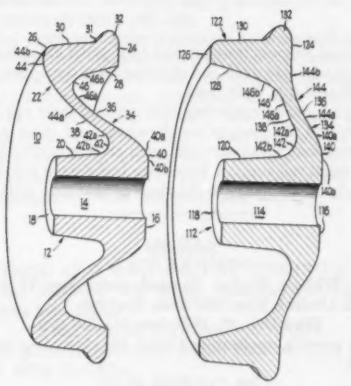
RAILROAD CAR WHEEL

Lawrence P. Greenfield, Evanston; George E. Novak, Riverside, and Daniel H. Stone, Evanston, all of Ill., assignors to Trailer Train Company, Chicago, Ill.

Filed May 20, 1977, Ser. No. 798,897

Int. Cl.[2] B60B *3/02, 17/00, 21/04, 23/00*

U.S. Cl. 295—21 10 Claims



1. A railroad car wheel having an axially elongated annular hub for connection to an axle defining an inner radial surface adapted for disposition in facing relating to the inner surface of a coacting wheel on the opposite end of the axle and an outboard surface facing outwardly of said wheel; an axially elongated annular tread defining rim portion disposed generally concentrically of the hub and defining an inner radial surface and an outboard surface spaced therefrom, said rim being displaced axially outwardly with respect to said hub and having a rail engaging surface provided with a radially extending flange adjacent said inner radial surface, and an integral relatively thin sectioned plate portion connecting said hub and said rim, said plate being generally frusto-conical and defining an inboard conical surface and an outboard conical surface, said plate joining said hub adjacent said inner radial surface thereof with said inner conical surface of said plate merging directly into said inner radial surface.

4,145,080

MEAT RAIL SUPPORT SYSTEM

Frank J. Miller, Warren, and Hem R. Vij, Fraser, both of Mich., assignors to Fruehauf Corporation, Detroit, Mich.

Filed Jul. 22, 1977, Ser. No. 818,210

Int. Cl.[2] B62D *27/02*

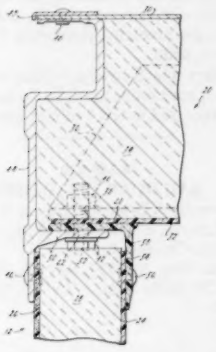
U.S. Cl. 296—183 5 Claims

1. An improved construction for an over-the-road refrigerator trailer comprising post-free side walls and a roof panel

having outer and inner skins with insulating structural foam therebetween,

an outer top rail secured to the outer skin of said side wall and having an inwardly extending flange above the upper extremity of said side wall,

an inner face of the innermost top rail secured to the inner skin of said side wall and having an outwardly extending flange at the upper extremity of said side wall,



a meat rail support beam in said roof panel extending laterally of said side walls and thereacross at the upper extremity of said side walls, and

a fastening means extending through said meat rail support beam and the flanges on the outer and inner top rails intermediate said outer and inner skins whereby loads on said meat rail support beams are transferred substantially equally and directly to the skins of said side wall.

4,145,081

VEHICLE SEAT

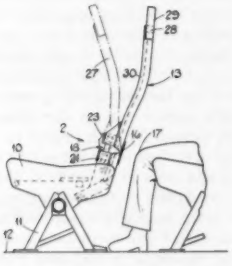
Leslie G. Withers, Warley, England, assignor to TI Accles & Pollock Limited, West Midlands, England

Filed Dec. 15, 1977, Ser. No. 861,020

Claims priority, application United Kingdom, Dec. 22, 1976, 53628/76

Int. Cl.[2] **B60R** *21/10*

U.S. Cl. 297—216 **7 Claims**



1. A vehicle seat having a seat portion and a back portion which is rigidly connected at its lower end to the seat portion, said back portion having a frame which includes a pair of side members, each side member having an upper part and a lower part which are hingedly connected together on a horizontal hinge axis which is disposed above said seat portion so as to be generally at about the knee height of a person sitting behind the vehicle seat in another similar seat, each of said side members being provided with an energy absorbing device which is connected to the associated side member and which is arranged to absorb energy in the event of an impact being applied to the upper part of the rear of the back portion in such a manner as to turn or tend to turn said upper part of the back portion about said horizontal hinge axis.

4,145,082

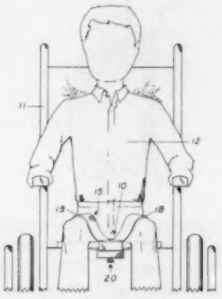
CRADLE FOR CONTROLLING ABNORMAL SITTING POSTURES

David M. Daly, 4116 Emerson #4, Dallas, Tex., and Cynthia L. Stone, both of Dallas, Tex., assignors to David M. Daly, Dallas, Tex.

Filed Apr. 11, 1977, Ser. No. 786,498

Int. Cl.[2] **A47C** *3/00, 25/00;* **A61F** *13/00*

U.S. Cl. 297—384 **10 Claims**



1. A support cradle for providing restraint of the upper legs and hips of a seated person comprising a pair of wall members, means to attach said wall members to a seat on which a seated person is to be positioned, said wall members each forming an inverted downwardly open receptacle having first wall portions overlying the upper legs of a person seated in a desired position and having integral second wall portions to form side walls to restrain lateral movement of legs within said receptacles from a desired position, said downwardly open receptacles having longitudinal axes extending generally parallel to a seat on which the support cradle is mounted, said longitudinal axes diverging in direction outwardly from the rear of a seat on which the cradle is supported, said receptacles being formed from material which resiliently increases the resistance of movement of a person whose legs are within said receptacles and is thereby restrained, to permit limited movement of a person restrained and substantially immediately start to restrain undesirable movement comprising hip flexion, hip adduction, hip internal rotation and hip extension, said second wall portion on the outer sides of said receptacles being free to move resiliently upwardly from the seat and the first wall portions restraining substantial upward movement of the legs of a person restrained.

4,145,083

THERAPEUTIC CHAIR FOR CEREBRAL PALSY CHILD

Frank K. Urban, 2455 N. Star, Columbus, Ohio 43215

Filed Jun. 17, 1977, Ser. No. 807,803

Int. Cl.[2] **A47C** *31/00, 3/00;* **A24B** *1/02*

U.S. Cl. 297—384 **11 Claims**

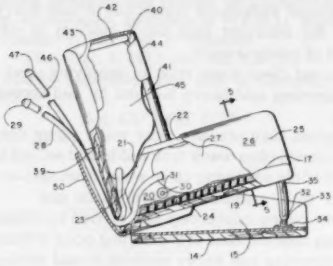
1. A therapeutic chair comprising a supporting base

a seat bottom including a bottom panel and longitudinally extending, rigid side walls disposed at opposite sides thereof in upwardly projecting relationship to said bottom panel, said seat bottom mounted on said supporting base for relative pivoting movement about a horizontal axis extending transversely to said seat bottom, and

a seat back mounted on said base in upstanding relationship to said seat bottom at the rear thereof, said seat back including a back panel and vertically extending, rigid side walls disposed at opposite sides of said panel in forwardly projecting relationship thereto,

each of said side walls of said seat bottoms and said seat back having respective inwardly facing surfaces and a selec-

tively inflatable cell mounted on each respective side wall at the inwardly facing surface thereof, each of said inflat-



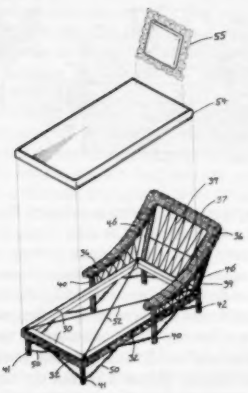
able cells having an inwardly facing surface portion displaceable independently toward the center of the chair in supporting relationship to an occupant of the chair.

4,145,084

MINIATURE WICKER FURNITURE AND METHOD OF ASSEMBLING SAME

Joan M. Capper, 900 High Green Ct., Marietta, Ga. 30067

Filed Jul. 25, 1977, Ser. No. 818,446
Int. Cl.[2] A47C *5/02*; A63H *33/00*
U.S. Cl. 297—418 **10 Claims**



1. An article of miniature furniture having a frame comprised of assembled seat base, back and leg members with at least one frame member including a support covered with imitation reedy wickerwork comprised of a sheet of wallpaper having a layer of wooven straw bonded to a backing sheet of paper.

4,145,085

DUMP TRAILER

Loren H. Taber, Star Route Box 11, Woodland, Calif. 95607; David R. Neilson, 809 2nd St., and Stefan Fuchslin, 814 Rosewood Way, both of Woodland, Calif. 95695

Filed Oct. 17, 1977, Ser. No. 842,475
Int. Cl.[2] B62D *63/06*
U.S. Cl. 298—5 **2 Claims**

1. A dump trailer comprising:

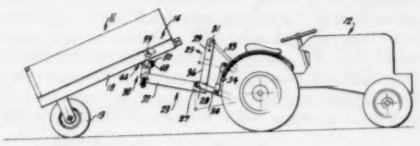
a. a bed having a forward end and an after end;

b. a pair of ground engaging support wheels mounted on an after portion of said bed;

c. a fore and aft elongated bellcrank pivotally connected at one end to a forward end portion of said bed, said bellcrank being further pivotally connected to a vehicle for towing the trailer,

d. actuator means connected to the vehicle and to said bellcrank for pivoting said bellcrank in a normally vertical plane in order selectively to raise and lower the forward end of said bed, said bellcrank having a first arm pivotally connected to said bed and a second arm, said bellcrank being pivotally connected to the vehicle at a junction of said first and said second arms, said actuator means comprising hydraulically actuated linkage connected between the vehicle and said second arm of said bellcrank;

e. a normally vertically extending universal joint pivotally connecting said one end of said bellcrank to the lower forward portion of said bed,



said universal joint comprising a first clevis having a longitudinal clevis pin and a second clevis having a transverse clevis pin; and,

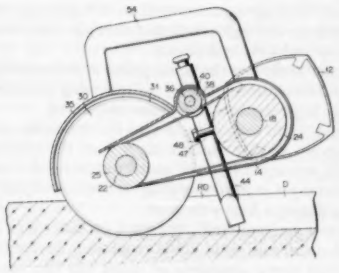
f. trailer centering means interposed between said one end of said bellcrank and said universal joint for yieldably urging said bed and said bellcrank into longitudinal alignment, said centering means comprising an upper sleeve and a lower sleeve with normally fully engaging conjugate beveled ends, a rod fixed to said upper sleeve and slidably extending through said lower sleeve, and a compression spring urging said upper sleeve end into full engagement with said lower sleeve end.

4,145,086

METHOD AND MACHINE FOR DIGGING DITCH

Masamitsu Ishihara, 628 Hirai, Kannami-cho, Tagata-gun, Shizuoka-ken, Japan

Filed Feb. 14, 1977, Ser. No. 768,495
Claims priority, application Japan, Feb. 14, 1976, 51-15355; May 11, 1976, 51-52824
Int. Cl.[2] E21C *25/52*
U.S. Cl. 299—15 **11 Claims**



1. A method of digging a ditch comprising the steps of cutting in the surface to be dug more than three channels to make a partition wall therebetween, said channels being in parallel with each other and spaced apart from each other by a suitable distance,

inserting a breaking rod into one of said channels except the outmost ones,

repeatedly swinging the breaking rod about a pivot point in a direction substantially perpendicular to the axis of the channel, and

alternately striking against two partition walls between the

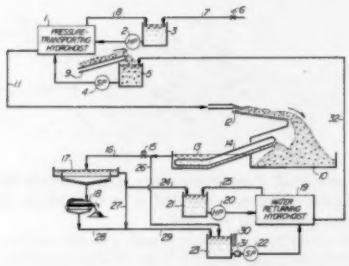
channels by means of the breaking rod, thereby fracturing the partition walls at the bases thereof.

4,145,087

SYSTEM FOR HYDRAULICALLY TRANSPORTING SOLID MATERIAL

Masakatsu Sakamoto, Matsudo; Kenji Uchida, Kashiwa, and Isao Honma, Abiko, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 6, 1977, Ser. No. 794,346
Claims priority, application Japan, May 12, 1976, 51-53273
Int. Cl.[2] B65G *53/30*
U.S. Cl. 302—14 **4 Claims**



1. A system for hydraulically transporting solid material comprising:

a. a first hydrohoist disposed at the starting point of the transportation of transporting, under pressure, particulate solid materials of a wide particle size distribution ranging from small to large particles;

b. a mixing tank for adding a heavy medium consisting of water and fine particles to said particulate solid materials to turn the latter into slurry;

c. a slurry pump connected to said mixing tank and to said first hydrohoist to transfer said slurry from said mixing tank to said first hydrohoist;

d. a first clear water tank for supplying clear water to said slurry in said first hydrohoist;

e. a first high-pressure clear water pump connected to said first clear water tank and to said first hydrohoist for forcibly supplying said clear water from said first clear water tank to said first hydrohoist;

f. transporting piping connected at its beginning end to said first hydrohoist through which said slurry is transported under pressure by said first hydrohoist;

g. a water removing device disposed at the terminating end of said transporting piping for removing particles of relatively large particle sizes from said slurry;

h. a solid-liquid separating device for removing particles of relatively smaller particle sizes from the portion of the slurry separated by said water removing device and for producing a slurry consisting of water and fine particles constituting a heavy medium;

i. a heavy medium tank connected to said water removing device and said solid-liquid separating device for receiving said slurry consisting of water and fine particles and for maintaining a predetermined density of said heavy medium;

j. densimeter and liquid level detecting means attached to said heavy medium tank;

k. a pipe connecting said water removing device to said solid-liquid separating device for delivering said slurry consisting of water and fine particles from said water removing device to said solid-liquid separating device;

l. a flow rate control valve disposed in the pipe defined in (k) above, for controlling the flow rate of said slurry consisting of water and fine particles delivered to said solid-liquid separating device in accordance with the density and the liquid level detected by said densimeter and said liquid level detecting means, thereby to control the concentration of said heavy medium in said heavy medium tank;

m. a second hydrohoist connected to said heavy medium tank for returning said heavy medium to said starting point of transportation;

n. a second clear water tank for supplying clear water for transporting said heavy medium by said second hydrohoist;

o. a second high-pressure clear water pump connected to said second clear water tank and to said second hydrohoist for forcibly supplying clear water from said second clear water tank to said second hydrohoist; and

p. return piping connecting said second hydrohoist to said mixing tank disposed at the starting point of transportation for returning said heavy medium to said mixing tank,

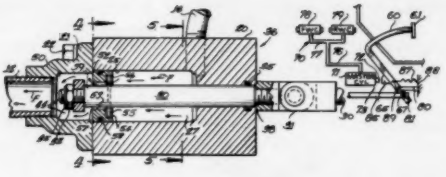
whereby said heavy medium is recycled to suspend and transport further particulate solid materials.

4,145,088

COMBINED POWER AND MANUALLY ACTIVATED BRAKE SYSTEM

Peter Wolf, Baroda, Mich., assignor to Lambert Brake Corporation, St. Joseph, Mich.

Filed Sep. 12, 1977, Ser. No. 832,557
Int. Cl.[2] B60T *13/18*
U.S. Cl. 303—2 **15 Claims**



1. A brake system comprising a primary fluid power brake subsystem and a secondary brake subsystem, the primary fluid power brake subsystem including a power valve having a housing defining an elongate bore closed at one end by a fixed end wall, a bi-ended valve rod extending through the housing end wall to be slid between spaced apart first, second and third positions, the rod having a first end outside the housing and a second end disposed inside the housing bore, an apertured annular piston slidably disposed within the housing bore, the aperture defined by the annular piston including a flow space normally permitting power fluid to flow through the annular piston, a reaction piston carried on the second rod end and radially extending to cover the annular piston flow space and engagingly move toward the annular piston to halt the normal flow of fluid through the annular piston and create a moveable end wall, the moveable end wall, fixed end wall and bore defining a collapsible chamber in the power valve, the power valve further including a fluid output port communicating with the collapsible chamber, and the primary brake subsystem further including conduit means to direct power fluid from the collapsible chamber toward a brake when the rod is urged through the housing from the first toward the third rod positions and the chamber is collapsed, and brake system controller means connected to the rod and extending to an operator's station to permit the operator to move the controller and connected rod between corresponding first, second and third positions, the brake system further including a secondary brake system actuator normally located at the second rod and controller positions for progressively increasing secondary brake subsystem actuation as the rod and controller move from the second toward the third positions.

4,145,089
VEHICLE LOAD-CONTROLLED BRAKE PRESSURE REGULATING VALVE DEVICE

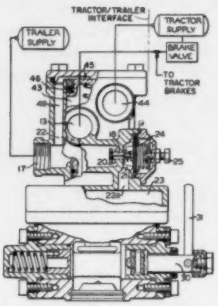
Erich Reinecke, Burgdorf, and Helmut Ulrich, Springe, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,703

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646288

Int. Cl.[2] B60T *8/18*

U.S. Cl. 303—22 R **10 Claims**



1. A vehicle fluid brake pressure control valve device including a self-lapping piston valve assembly common to a relay valve portion, a load-responsive regulating valve portion and an emergency valve portion of said control valve device, said piston valve assembly being operative to control the vehicle brake cylinder pressure in accordance with the differential force between a brake valve supplied control pressure and the effective brake cylinder pressure acting opposingly on a first member of said piston valve assembly that is movable relative to a second member thereof, said first member including a third member movable relative to said first member, said third member having a valve element engageable with a supply valve seat on said first member to control the delivery of supply fluid pressure and an exhaust valve seat on said second member to control the venting of brake cylinder fluid pressure, said second member being positioned relative to said first member according to the vehicle load condition, thereby varying the effective pressure area of said first member subject to said brake cylinder pressure, said emergency valve portion including actuating piston means engageable with said first member responsive to the loss of said control fluid pressure for controlling brake cylinder pressure via said common piston valve assembly.

4,145,090
CONTINUAL QUICK SERVICE VALVE DEVICE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Mar. 21, 1977, Ser. No. 779,672

Int. Cl.[2] B60T *15/44*

U.S. Cl. 303—37 **14 Claims**

1. In a fluid pressure brake equipment, the combination of a brake pipe normally charged with fluid to a certain chosen pressure and a continual quick service valve device comprising:

(a) a control volume,

(b) choke means for controlling the rate of flow of fluid under pressure from the brake pipe to said control volume whereby said control volume is charged with fluid under pressure from the brake pipe to the same pressure as that in the brake pipe,

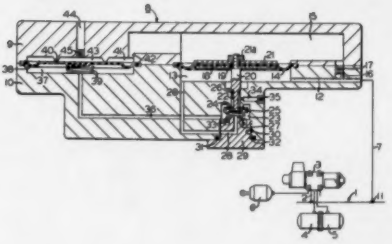
(c) a first fluid pressure operated valve means operatively responsive to a reduction of the pressure in the brake pipe to effect the release of fluid under pressure from the control volume to atmosphere, and

(d) second fluid pressure operated valve means comprising:

(i) a first annular valve seat,

(ii) a second annular valve seat coaxial with and spaced apart from said first annular valve seat,

(iii) a valve element disposed between said first and second valve seats for, when in engagement with said first valve seat, cutting off flow of fluid under pressure from both the brake pipe and said first fluid pressure operated valve means to atmosphere and establishing a communication between the brake pipe and said first fluid pressure operated valve means whereby said first fluid pressure operated valve means is caused to operate to prevent the release of fluid under pressure from the control volume to atmosphere, when in engagement with said second valve seat, cutting off flow from the brake pipe to said first fluid pressure operated valve means and establishing a communication through which fluid under pressure may flow from said first fluid pressure operated valve means to atmosphere whereby said first fluid pressure operated valve means is caused to



operate to release fluid under pressure from said control volume to atmosphere, and when disengaged from both of said valve seats, establishing a communication through which fluid under pressure may flow from both the brake pipe and said first fluid pressure operated valve means to atmosphere,

(iv) a movable abutment subject on its respective opposite sides to the pressure in said control volume and in the brake pipe and so operably connected to said valve element as to effect shifting of said valve element away from said first valve seat and into engagement with said second valve seat in response to a reduction of pressure in the brake pipe and the release of fluid under pressure from said control volume being effective to cause the shifting of said valve element away from said second valve seat and into engagement with said first valve seat thereby enabling successive sequential operation of said first and second fluid pressure operated valve means to release fluid under pressure from said brake pipe to atmosphere in cycles so long as the reduction in the brake pipe pressure continues, and

(v) biasing means normally effective to shift said valve into engagement with said first valve seat.

4,145,091
DUAL RELAY CONTROL VALVE HAVING INTEGRAL SOLENOID VALVE

Richard C. Bueler, Des Peres, and Dennis M. McWilliams, Florissant, both of Mo., assignors to Wagner Electric Corporation, St. Louis, Mo.

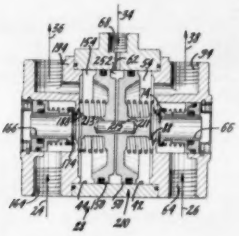
Filed Sep. 30, 1977, Ser. No. 838,371

Int. Cl.[2] B60T *13/68, 15/12, 15/18*

U.S. Cl. 303—118 **6 Claims**

6. A service brake control system for a towed vehicle whose service brakes are actuated in proportion to variable air pressure from a tractor to which it is connected comprising:

(a) a manual brake controller in said tractor;
(b) air pressure supply means for connecting pressurized air to said manual brake controller;
(c) an air only actuated dual relay control valve in said towed vehicle having first and second air pressure inlets, a control air pressure inlet and first and second air pressure outlets;
(d) said manual brake controller being effective to meter varying air pressure to its outlet in proportion to a manual input;
(e) first air pressure connection means for connecting the varying air pressure from said manual brake controller to said control air pressure inlet;
(f) first and second check valves in said towed vehicle;
(g) first and second reservoirs connected respectively to said first and second check valves;
(h) first means for connecting said first reservoir to said first air pressure inlet;
(i) second means for connecting said second reservoir to said second air pressure inlet;
(j) second air pressure connection means for connecting said air pressure supply means to said first and second check valves;



(k) first and second service brake conduits connected respectively to said first and second air pressure outlets; and
(l) said dual relay control valve comprising:
(i) a body;
(ii) at least first and second pistons sealably enclosed and moveable within said body;
(iii) said varying air pressure being connected at least to one side of the first control piston;
(iv) means actuated by said varying air pressure for connecting and varying the air pressure from said first air pressure inlet to said first air pressure outlet in proportion to movement of said first control piston;
(v) means for connecting a variable air pressure which varies substantially in proportion to said varying air to one side of said second control piston;
(vi) means actuated by said variable air pressure for connecting and varying the air pressure from said second air pressure inlet to said second air pressure outlet in proportion to said variable air pressure; and
(vii) mechanical means for actuating said second control piston by said first control piston in case of failure of said variable air pressure.

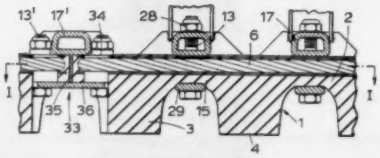
4,145,092

FLEXIBLE TRACK FOR VEHICLES

Hans Kasin, Notodden, Norway, assignor to Gravbergskovens Aktieselskab, Sarpsborg, Norway

Filed Jan. 31, 1977, Ser. No. 764,107
Claims priority, application Norway, Feb. 18, 1976, 760540
Int. Cl.[2] B62D 55/24
U.S. Cl. 305—35 EB **8 Claims**

1. An endless vehicle drive track which comprises at least two transversely spaced parallel track belts, each track belt comprising a plurality of elongate track units which are arranged one after another in the longitudinal direction of the track belt, and transverse connecting members provided between the ends of adjacent track units to connect the track units with one another, each track unit comprising:
an integral pad which is made of rubber or similar material and has an inner face and an outer face and is formed at its outer face with a plurality of transversely-extending longitudinally-spaced gripping ribs which are integral with the pad, adjacent ribs defining transversely-extending channels therebetween, the channels of each pad of one belt being aligned with respective channels of the pads of each other belt;
first and second transverse retainer members provided at opposite respective ends of the pad and at least partly embedded in the material of the pad said retainer members being connected respectively to
the two transverse connecting members provided between the ends of the track unit and the two adjacent track units respectively; and



an elongate reinforcing cable embedded in the material of the pad and extending through the body of the pad, the cable forming a single, closed, substantially rectangular loop extending around the periphery of the pad and outside the retainer members to be retained thereby against movement in the longitudinal direction of the pad, and the track further comprising a plurality of transversely-extending longitudinally-spaced drive bars connecting the belts together, each drive bar being disposed at the inner face of a pad of each belt at a position corresponding to a channel defined between two adjacent ribs of a pad of said belt and being secured to each such pad by at least one fastening member which extends through the pad into said channel, there being one drive bar for each channel of said one belt.

4,145,093

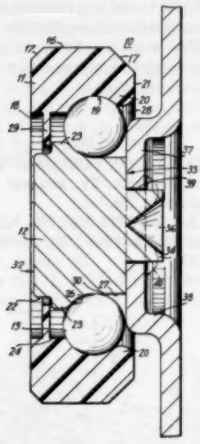
BALL BEARING ROLLER ASSEMBLY

Michael Sekerich, Spring Valley, N.Y., assignor to Buildex, Inc., West Nyack, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,530
Int. Cl.[2] F16C 29/04, 33/00
U.S. Cl. 308—3.8 **6 Claims**

1. A ball bearing roller assembly comprising an inner core member having an inner race defining circular outer peripheral face, an outer roller member of resilient plastic in coaxial registry with said core member and having an outer race defining circular inner peripheral face spaced from said core member outer peripheral face and defining therewith a ball bearing housing annular space, a plurality of ball bearings disposed in said annular space and entrapped between said races, said annular space having a front annular throat of relatively small width less than the diameter of a ball bearing to lock said ball bearings against forward longitudinal movement and a rear throat of relatively greater width less than the diameter of a ball bearing to releasably retain said ball bearings in said annular space by permitting compression of the resilient plastic roller member to release the ball bearings, a support plate having a raised circular section coaxial with and joined to said

core member and at least partially covering said rear throat and being proximate to and confronting the rear faces of said



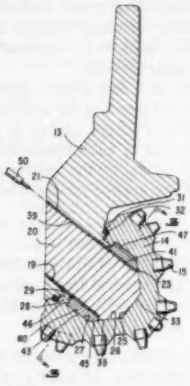
ball bearings whereby to lock said ball bearings against longitudinal movement through said rear throat.

4,145,094

ROTARY ROCK BIT AND METHOD OF MAKING SAME

Edward Vezirian, Fountain Valley, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 9, 1977, Ser. No. 849,771
Int. Cl.[2] F16C *33/00*
U.S. Cl. 308—8.2 **21 Claims**



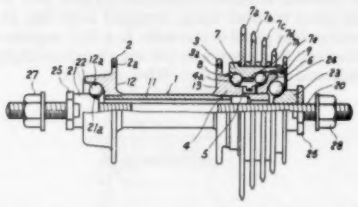
1. A rotary rock bit having a main bit body with at least one leg extending downwardly therefrom, each leg comprising:
- a bore extending through the lower extremity of said leg;
- a journal pin having a mounting end extending into said bore and a bearing end;
- a cutter rotatably supported on the bearing end of said journal pin;
- annular means located about the bearing end of said journal pin for axially retaining said cutter on said journal pin, said annular retaining means comprising a hollow cylindrical thrust member, the interior of which extends around the bearing end of said journal pin; and
- weld means extending along the mounting and bearing ends of said journal pin for securing said journal pin to the bore of said leg and for securing the annular retaining means to said journal pin.

4,145,095

HUB WITH FREE WHEEL FOR A BICYCLE

Takashi Segawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 702,207, Jul. 2, 1976, abandoned. This application Mar. 21, 1978, Ser. No. 888,635
Claims priority, application Japan, Jul. 10, 1975, 50-84991; Jun. 14, 1976, 51-70045
Int. Cl.[2] F16C *33/00*
U.S. Cl. 308—192 **4 Claims**



1. A unit hub for a bicycle, said hub comprising:
- a hub shaft;
- a hub body rotatably supported by said hub shaft, said hub body comprising a tube of a given length and two separate end members;
- one of said two end members defining a bearing cone at one axial end of said hub body, said bearing cone comprising an extension having an intermediate portion and an end portion extending from a root portion thereof and terminating in said end, said bearing cone further comprising:
  - a ball race at the root portion of the extension thereof,
  - a threaded portion on the outer periphery of the end of the extension thereof, and
  - pawls on the intermediate portion of the extension intermediate the root portion and the end thereof;
- a bearing ring screwed onto the threaded portion of the end of the bearing cone, said bearing ring having a ball race on the outer periphery of one axial end thereof;
- a drive member sleeved onto the outer periphery of the bearing cone and bearing ring and being unidirectionally rotatably supported with respect thereto, said drive member having:
  - at least one sprocket wheel on the outer periphery thereof,
  - ratchet teeth on the inner periphery thereof, in mesh with said pawls, and
  - ball races at each axial end of the ratchet teeth with balls; and
  - a ball holder with balls screwed onto each end of said hub shaft,
- said drive member being supported through balls positioned between said ball races thereon and said ball races on said bearing cone and on said bearing ring so that said hub body carrying said drive member therewith is rotatably supported with respect to said hub shaft by said ball holders screwed thereto and said balls, both of said ball races and balls supporting said drive member being disposed axially inwardly of said ball holders and balls screwed onto said hub shaft.

4,145,096

DUAL PIVOTING PANEL CLOSURE

Heinz Sitsen, Krefeld-Fischeln, and Otto Goppold, Krefeld, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

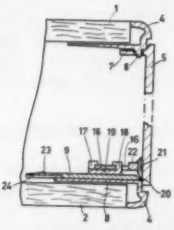
Filed Sep. 21, 1977, Ser. No. 835,042
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642508
Int. Cl.[2] A47B *81/06*
U.S. Cl. 312—7 TV **8 Claims**

1. A device with an improved pivoting panel closure, said

device having an internal space bounded by first and second spaced frame faces, and a panel assembly including a panel closing at least part of an area between said faces, wherein

said device comprises first pivot means defining a first pivot axis adjacent said second face, formed by means releasably connecting said panel to the frame, said connecting means comprising at least one projecting element engaging at least one respective aperture,

said assembly includes a pivot member connected to the panel and having second pivot means, said device including means for mounting the member for sliding motion in an outward direction transverse to said first pivot axis, said pivot member being arranged such that in a closed position said panel is pivotable in a first angular direction about said first pivot axis toward an intermediate position while said pivot member slides outward,



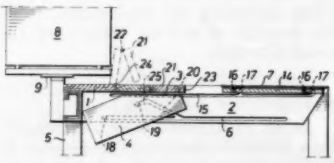
said assembly is arranged such that in said intermediate position said panel is pivotable about a second pivot axis defined by said pivot means and parallel to said first pivot axis, in a second angular direction opposite said first angular direction without further sliding movement of the pivot member, and said device additionally comprising latching means for holding said panel in a closed position, said latching means including a latching element having a latching projection and a panel-opening surface, means for guiding said latching element for movement between first and second positions, and means cooperating with said latching projection for locking said panel in a closed position when said latching element is in the first position; and means engaging said panel-opening surface upon movement of the latching element from the first to second position while the panel is closed for pivoting said panel about said first pivot axis to an at least partially open position.

4,145,097

DATA TERMINAL DESK

Ture P. A. Naess, Grankarr, S-560 30 Grönna, and Sven G. V. Larsson, Skogsvagen 37, S-560 28 Lekeryd, both of Sweden

Filed Dec. 5, 1977, Ser. No. 857,618
Claims priority, application Sweden, Dec. 6, 1976, 7613636
Int. Cl.[2] A47B *37/00*
U.S. Cl. 312—196 **2 Claims**



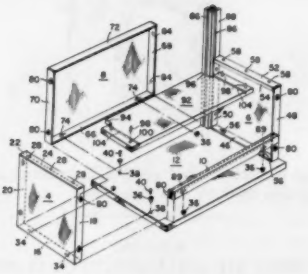
1. A data terminal desk comprising a slidable screen and a holder for a keyboard, said holder being slidable in a direction perpendicular to a back of the desk between a working position with the keyboard holder in a recess in a front part of the desk top of the desk and a rest position with the keyboard holder and keyboard closer to the back and totally beneath the desk top; a removable cover covering the recess in the rest position and removable from the recess; an opening in the desk top in the front of the rest position of the keyboard holder covered by a removable flap and through which opening the keyboard is operationally accessible in the rest position, said keyboard and holder being in an inclined attitude, thereby leaving a substantial portion of the desk top clear for working space; said slidable viewing screen being slidably mounted on the back of the desk for movement therealong.

4,145,098

ARTICLE OF FURNISHING

Robert L. Alexander, Erlanger, Ky., assignor to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Jul. 10, 1978, Ser. No. 923,218
Int. Cl.[2] A47B *47/03, 17/00*
U.S. Cl. 312—257 SM **10 Claims**



1. An article of furnishing comprising:

a plurality of upstanding sheet panels,

a substantially horizontal connecting panel,

sliding joint means for removably connecting the upstanding panels to the connecting panel, said sliding joint means comprising headed members secured to the connecting panel and keyhole slots in the upstanding panels for receiving each headed member,

an upright adjacent each end of each upstanding panel, and

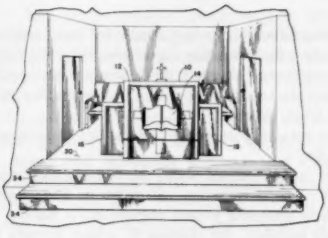
sliding joint means for securing the upstanding panels to the uprights including a flange having at least one headed member at each end of each upstanding panel and "T" shaped openings extending the length of the uprights for the reception of the headed members in the uprights.

4,145,099

RETRACTABLE PULPIT OR THE LIKE

George E. Mitchell, 210 Admiral Dr., London, Canada

Filed Dec. 29, 1977, Ser. No. 865,535
Int. Cl.[2] A47G *33/00*
U.S. Cl. 312—33 **2 Claims**



1. A retractable pulpit or the like adapted to retract into an opening in the floor of an edifice comprising a central retable having a front vertical panel, depending side walls and horizontal brackets extending from its lower section; side tables

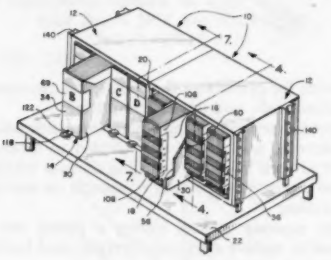
swingably hinged to said retable and foldable therein; said front panel being foldably connected to said opening so that said opening receives said retable when containing said side tables, with a portion of the surface of said front panel serving as floor surface in covering said opening in the retracted mode of the pulpit, further including a recess on the outer surface of said front panel and a top panel foldably secured to said opening, said top panel fitting in said recess of said front panel when said retable is in said opening, such that the surface of said top panel serves as floor surface in covering said opening in the retracted mode of the pulpit.

4,145,100

SIDE TAB FILE

Gerald R. Klaus, St. Charles, Ill., assignor to Fellowes Manufacturing Company, Itasca, Ill.

Filed Dec. 8, 1977, Ser. No. 858,670
Int. Cl.[2] A47B *43/02, 63/06*
U.S. Cl. 312—261 **32 Claims**



1. A compartment for storing side-tabbed files or the like, comprising:

a cabinet including at least one open side;

at least one file tray including a bottom wall, two opposed side walls, an end wall, an open-end opposite said end wall, means for restraining stored files from movement out of said open-end, including a first flap formed integrally with said file tray, which first flap is adjustable between a functional upright position and a nonfunctional position overlying a wall of said file tray, and means for positioning stored files partially outward said open-end, including a second flap formed integrally with said file tray, which second flap is adjustable between a functional position forming a step adjacent said end wall and a nonfunctional position overlying at least one wall of said file tray; and

wherein said cabinet receives said file tray through said open side.

4,145,101

METHOD FOR MANUFACTURING GAS INSULATED ELECTRICAL APPARATUS

Ryozo Takeuchi, Hitachi, and Tatsuo Igawa, Kitaibaraki, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 6, 1976, Ser. No. 674,083
Claims priority, application Japan, Apr. 18, 1975, 50-47274
Int. Cl.[2] H01J *9/00*
U.S. Cl. 316—4 **24 Claims**

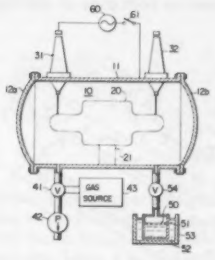
1. A method for manufacturing a gas insulated electrical apparatus having an electrical apparatus body to which a high voltage is to be applied, a sealed chamber enclosing said apparatus body and filled with electrical-insulation gas, and an electrical insulation support member for supporting said apparatus body within said chamber and electrically insulating said apparatus body from said chamber, comprising the steps of:

(a) assembling said gas insulated electrical apparatus;

(b) evacuating air from within said chamber after the completion of said assembling step (a) to reduce the internal pressure of said chamber;

(c) introducing fluid electrical-insulating film forming material into said chamber;

(d) depositing said electrical-insulation film forming material on the inner wall of said chamber and on the surface of said apparatus body through a polymerization reaction to form an electrical-insulation film coating thereon;



(e) reducing the internal pressure of said chamber after the formation of said electrical-insulation film coating;

(f) introducing an electrical-insulation gas into said chamber after said internal pressure reducing step (e); and

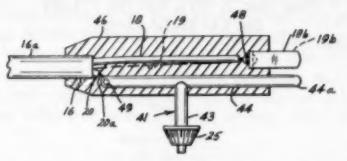
(g) sealing said chamber.

4,145,102

COMBINED CHUCK WRENCH AND ELECTRIC PLUG

John V. Felter, Austin, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Oct. 7, 1977, Ser. No. 840,272
Int. Cl.[2] B25B *13/44*; H01R *3/00, 13/40*
U.S. Cl. 339—14 P **10 Claims**



1. Combined chuck wrench and electric plug apparatus, comprising a molded plug body, electric conductor means extending through said body, plug contact means connected to said electric conductor means within said body and extending from said body and being adapted for insertion into an electric socket, and chuck wrench means disposed with its handle portion fixedly molded within said plug body and its wrench portion extending from said plug body, said handle portion having an angular portion molded within said plug body whereby said handle portion is fixed against removal from said plug body and against rotation with respect to said plug body whereby said plug body forms a handle for said wrench portion and whereby said wrench portion is not conveniently assessible for use unless said plug contact means are disconnected from a said electric socket.

4,145,103

CONNECTOR WITH LOW PROFILE LATCH

Robert G. Knowles, Litchfield, Conn., assignor to Litton Systems, Inc., Oakville, Conn.

Filed Jun. 1, 1978, Ser. No. 911,533
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **5 Claims**

1. In a connector for terminating flat multi-conductor cables including a lower contact support mounting a plurality of insulation displacement contacts and an upper pressure member, the combination comprising:

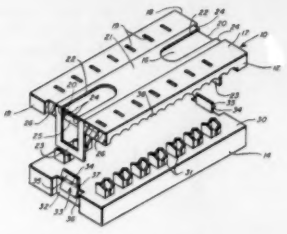
a clip means for reinforcing said upper pressure member for

securing said upper pressure member to said lower contact support in two positions,

a first channel means formed along the top and two opposite ends of said upper pressure member for receiving said clip means therein,

second and third channel means located on opposite ends of said lower contact support,

latch means formed on both ends of said clip means,



a detent partially positioned in each of said second and third channel means,

support section means formed on said detent for supporting said latch means in a first position,

first catch means for preventing withdrawal of said latch means from said support section means, and

second catch means for preventing withdrawal of said latch means from a second position.

4,145,104

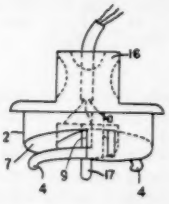
PLUG CONNECTION

Heinz Fischer, Weserstr. 114, Langwedel-Daverden, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,641

Int. Cl.² H01R *13/62*

U.S. Cl. 339—65 **7 Claims**



1. In a plug connection consisting of two connectable plug contact holders, namely a plug or other lead-in holder with lead-in contacts, and a socket or other connection holder including connection contacts which are protected against accidental contact behind orifices for the insertion of said lead-in contacts,

the improvement comprising means defining at least two angularly spaced socket helical guides of insulating material and a socket axial limiting surface at the socket or other connection holder for leading-in the pins or other lead-in contacts through the orifices to the contact-protected connection socket contacts,

the projection of each helical guide subtending an angle about the socket axis that is substantially equal to 360° divided by the number of said helical guides,

a corresponding plurality of angularly spaced plug helical guides of insulating material and plug helical contacts at the plug for mating relationship with said first-mentioned socket helical guides and socket contacts respectively and a plug axial limiting surface coacting with the socket axial limiting surface for limiting angular relative movement between the plug and socket as the plug is mated with the socket.

4,145,105

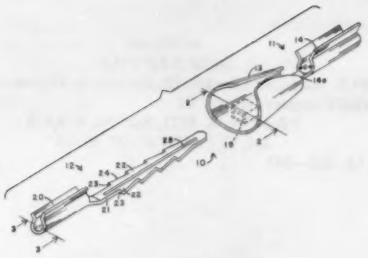
APPARATUS FOR PREVENTING ACCIDENTAL DISCONNECTION OF ELECTRICAL CORDS

James H. Dobson, 328 Woodcrest, Sulphur Springs, Tex. 75482

Filed Jan. 31, 1978, Ser. No. 873,795

Int. Cl.² H01R *13/54*

U.S. Cl. 339—75 P **5 Claims**



1. A device for preventing the accidential disconnection of two electrical cords, said device comprising:

a first separate section having a plug receptacle and a detent slot thereon, said detent slot adapted to receive a first electrical cord having a first plug thereon which in turn will be received in said plug receptacle on said first separate section;

a second separate section having a detent slot thereon adapted to receive a second electrical cord having a second plug thereon; and

adjustable means for connecting said first and second separate sections together in a position to secure said first and second plugs together when said plugs are in a connected position.

4,145,106

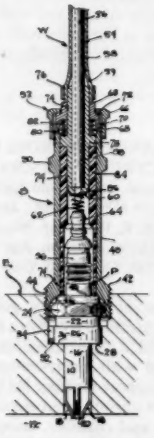
SHIELDING DEVICE FOR ORIENTED SPARK PLUGS

Russell G. Livingston, Redding, Calif., assignor to Livingston Industries, Incorporated, Redding, Calif.

Filed Oct. 31, 1977, Ser. No. 847,124

Int. Cl.² H01R *13/34*

U.S. Cl. 339—143 S **18 Claims**



1. A separate and removable spark plug shield for use with a spark plug, said shield comprising: an elongated hollow body with a central bore sized to receive the body of a spark plug,

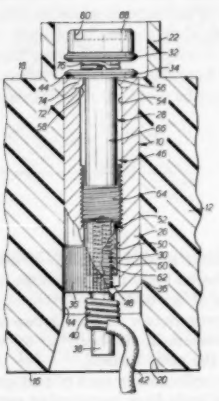
said elongated body having an internal shoulder in said central bore facing an end of the elongated body for engagement with the body of a spark plug, said elongated body having means cooperative with and securable to an engine for axially forcing said body of said plug toward said engine and clamping the body of said plug between said shoulder and the engine, and means at the other end of said body for connecting a shielded ignition wire to said body in contact with the plug.

4,145,107

TERMINAL ASSEMBLY WITH CAPTIVE SELF-EMERGENT SCREW POST

Lon De Haitre, Arlington Heights, Ill., assignor to Abbott/Interfast Corporation, Chicago, Ill.

Filed Jan. 9, 1978, Ser. No. 867,781
Int. Cl.[2] H01R 9/10
U.S. Cl. 339—263 R **17 Claims**



1. An electrical terminal assembly adapted to be installed in an insulating terminal block for providing connections at opposite ends thereof to external electrical circuits which comprises:

A. a shell of metal having a blind-ended bore therein and a screw post having a shaft at least a portion of which is disposed within the bore and having a drive head on an end thereof exterior of the shell adapted to cooperate with a seat formed on the axial external end of the shell adjacent the entrance of the bore to clamp conductor means to the shell,

B. means on the interior of the bore and the exterior of the screw post cooperating to provide a screw engagement of the screw post and shell but only when a substantial portion of the shaft of the screw post is axially within the bore,

C. spring means within the bore and biasing the shaft of the post to be driven out of the bore,

D. stop means in the bore at the entrance on the interior thereof limiting the movement of the shaft of the post in its emerging direction, and

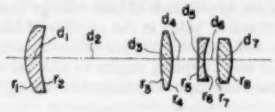
E. the cooperating means on the interior of the bore and the exterior of the screw post being arranged and dimensioned so that when free of the screw engagement the shaft of the post is free to move axially without rotation to the limit defined by said stop means.

4,145,108

PHOTO EYEPIECE FOR MICROSCOPES

Hideo Itaya, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1977, Ser. No. 813,424
Claims priority, application Japan, Jul. 15, 1976, 51-84352
Int. Cl.[2] G02B 3/00, 9/34
U.S. Cl. 350—175 E **4 Claims**



1. A photo eyepiece for microscopes comprising a front lens group comprising a first lens and rear lens group comprising a second, third and fourth lenses, said first lens being a positive lens, said second lens being a biconvex lens, said third lens being a negative lens, said fourth lens being a biconvex lens, said photo eyepiece for microscopes satisfying the following conditions:

$$2.0 < 1/f234 < 2.77 \quad (1)$$

$$0.73 < d2/f < 0.75 \quad (2)$$

$$0.2 < |r6| /f < 0.26 \quad (3)$$

$$1.65 < (n2 + n4/2 < 1.68 \quad (4)$$

$$0.06 < n3 - n4 < 0.084$$

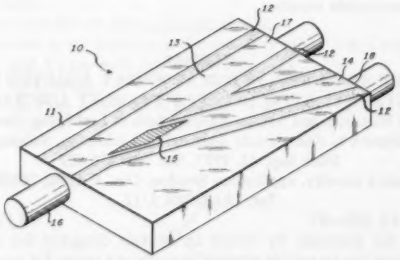
wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol f1 represents the focal length of the first lens, i.e., of the front lens group, reference symbol f234 represent the focal length of the rear lens group, reference symbol r6 represents the radius of curvature of the surface on the image side of the third lens, reference symbol d2 represents the airspace between the front and rear lens groups, and reference symbols n2, n3 and n4 respectively represent refractive indices of the second, third and fourth lenses.

4,145,109

ELECTRO-OPTIC MULTIPLEXING WITH HIGH INTERCHANNEL ISOLATION

Arthur R. Nelson, Stow, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 12, 1977, Ser. No. 796,103
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.14 **22 Claims**



1. A switchable optical coupling apparatus comprising:

a wafer of electro-optic material;

means for creating optical walls in said wafer which establish a region for a main optical waveguide, a region for a branch optical waveguide, and a coupling region therebetween;

a first electrode pattern formed on one major surface of said wafer including a gate electrode electrically isolated from other electrodes in said pattern and positioned therein to be within the outlines of said coupling region;

a second electrode pattern, formed on an opposing surface of said wafer, substantially identical to and substantially in registration with said first electrode pattern; and

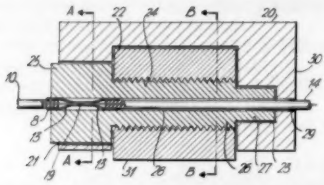
means for applying a gate voltage across said wafer through said gate electrodes of said first and second electrode patterns, the application of said voltage causing a change in the refractive index in the portion of said wafer lying between said gate electrodes whereby a barrier wall is formed in said coupling region to provide a substantially continuous main optical waveguide through said wafer.

4,145,110

OPTICAL FIBRE CONNECTOR FOR VARIABLE SIGNAL ATTENUATION

Otto I. Szentesi, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 8, 1977, Ser. No. 785,776
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.15 **1 Claim**



1. An optical fibre connector for variable optical signal attenuation comprising:

a connecting element with a common bore of size to fit two uncoated fibers in end to end relationship; said connecting element including two further bores, one on each end of said common bore, a first bore of a size to accept a first coated fiber with a close sliding fit and means for permanently securing said coated fiber to said connecting element, and a second bore of a size to accept a second coated fiber with a sliding fit to allow axial movement of said second fiber;

a moveable member, said second fiber secured therein and said positioning means in engagement with said moveable member; and

a positioning means for varying the end separation of said optical fibres related to one another, said positioning means acting between said connecting element and said moveable member; and comprising a captive nut held in a fixed housing and mounted on a threaded portion of said moveable member.

4,145,111

LASER BEAM REFLECTOR ASSEMBLY ADAPTED FOR EXTERNAL ATTACHMENT TO TARGET AIRCRAFT

Hans Hansson, and Krister Karling, both of Linköping, Sweden, assignors to Saab-Scania Aktiebolag, Linköping, Sweden

Filed Sep. 22, 1977, Ser. No. 835,639
Claims priority, application Sweden, Oct. 4, 1976, 7610948
Int. Cl.[2] G02B 5/12
U.S. Cl. 350—97 **5 Claims**

1. An assembly by which an aircraft designed for other missions can be readily adapted to serve as a target for gunnery practice wherein firing of projectiles is simulated by emission of laser beams directed in accordance with aiming of a weapon from which the firing is assumed to occur, said assembly comprising a plurality of substantially identical retroreflectors, each of which has an axis and is capable of reciprocal direction reflection of only those beams reaching the reflector from sources within a limited substantially conical incident sector that has its apex at the retroreflector and is symmetrical to the retroreflector axis, but said assembly nevertheless enabling a laser beam arriving at the aircraft from substantially any direction to be reflected in the reciprocal direction so that the reflection of the laser beam can be detected at its source, and said assembly being detachably securable to the aircraft and having substantially the same effect upon the performance of the aircraft as an external load which the aircraft is designed to carry, said assembly being characterized by:

A. an elongated aerodynamically slender carrying body

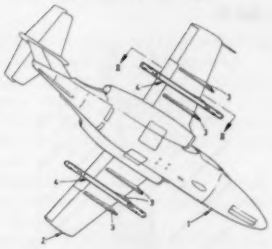
(1) having a longitudinal axis and

(2) having means thereon by which said body can be supported on an aircraft, at the exterior thereof, with said longitudinal axis substantially aligned with a normal flight direction of the aircraft;

B. one of said retroreflectors being located at each extremity of said body, each of said retroreflectors at a body extremity

(1) facing lengthwise outwardly from the body; and

(2) having its axis in substantial coincidence with said longitudinal axis; and



C. the remainder of said plurality of retroreflectors being arranged on the body in two groups, one group at each end portion of the body,

(1) each retroreflector of each group being in a laterally opening recess in the body to be wholly within the limits of the body surface,

(2) the retroreflectors in each of said groups being spaced along the body from one another and from the retroreflector at the adjacent extremity of the body so that the thickness of the body need not be substantially greater than a maximum dimension of a retroreflector, and

(3) the several retroreflectors in each group having their respective axes

(a) substantially radial to said longitudinal axis,

(b) all inclined towards the adjacent extremity of the body at substantially like oblique angles to said longitudinal axis, and

(c) extending from said longitudinal axis in different directions such that the incident sectors of the several retroreflectors at each end portion of the body are complementary to one another and are collectively complementary to the collective incident sectors of the retroreflectors at the other end portion of the body.

4,145,112

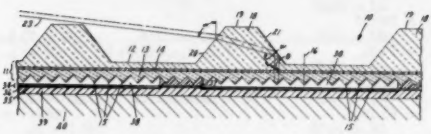
LOW-PROFILE RAISED RETROREFLECTIVE SHEETING

Richard L. Crone, Woodbury, and Robert L. Elton, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 14, 1977, Ser. No. 815,568
Int. Cl.[2] G02B 5/124
U.S. Cl. 350—103 **27 Claims**

1. Low profile raised retroreflective sheeting which may be

wound into a storage roll and rapidly unwound and applied to a substrate where it is capable of brightly retroreflecting high-incidence-angle light, said sheeting comprising a base sheet extending in the plane of the sheeting and configured on its bottom face with cube-corner retroreflective elements adapted to reflect light that impinges on the opposite face of the sheet within a predetermined angular range; and a light-directing sheet joined to said opposite face and configured on its top surface with a longitudinally-extending series of projections less than about 3 millimeters in height, said projections having



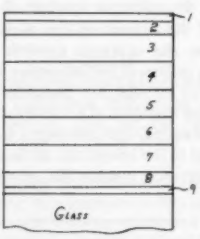
a trapezoidal cross-section with the legs of the trapezoid being the front and back edge surfaces of the projection, the front edge surface being disposed across the path of said high-incident-angle-light so as to transmit a high percentage of any of such light that impinges on the surface; and the back edge surface of the projection being disposed to both reflect light transmitted by the front edge surface to a path within said predetermined angular range for retroreflection by the retroreflective elements, and to return light reflected by the retroreflective elements back through the front edge surface toward its source.

4,145,113

COLOR CORRECTING INTERFERENCE FILTER

Guenther Ranninger, and Franz Twaroch, both of Vienna, Austria, assignors to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Aug. 5, 1977, Ser. No. 822,123
Int. Cl.[2] G02B 5/28
U.S. Cl. 350—166 **2 Claims**



1. In an instrument having a light source with a chosen spectral energy distribution, an optical system including optical elements that change the energy distribution of light passing therethrough and detection means responsive to light, the detection means being adapted to respond in a given manner to said chosen energy distribution, the improvement comprising an interference filter having a transparent substrate and nine alternating layers of first and second dielectric coating materials; said first material having a given index of refraction; said second material having an index of refraction of about 1.5 times said given index of refraction; the first and ninth layers having a thickness of $\lambda_o/16$, the second and eighth layers having a thickness of $\lambda_o/8$ and the remaining layers having a thickness of $\lambda_o/4$ and where 480 nm $\leqq \lambda_o \leqq$ 670 nm.

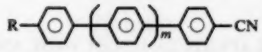
4,145,114

PLEOCHROIC DYES

David Coates, Hessle; George W. Gray, Cottingham, and Damien G. McDonnell, Hull, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

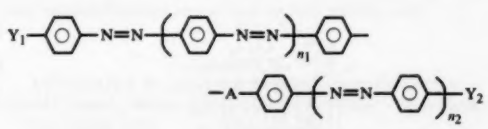
Filed Jun. 14, 1976, Ser. No. 695,404
Claims priority, application United Kingdom, Jun. 17, 1975, 25843/75; Jun. 17, 1975, 25859/75; Dec. 31, 1975, 53397/75; Dec. 31, 1975, 53398/75
Int. Cl.[2] C09K 3/34; G02F 1/13
U.S. Cl. 350—349 **11 Claims**

1. A liquid crystal electro-optic device comprising two dielectric substrates at least one of which is optically transparent, at least one electrode on the inner surface of each substrate, and a layer of material sandwiched between the substrates, characterized in that said material is a liquid crystal twist-type nematic or cholesteric-to-nematic system which comprises a mixture of compounds each having a generalized formula



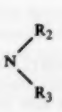
wherein R is an alkyl or alkoxy group and m = 0 or 1, at least one of said compounds being cyanobiphenyl wherein m = 0, said material including in solution a dye having a formula selected from one of the following:

(I)



(II) a derivative of formula (I) wherein any of the lateral positions on any one of the benzene rings is substituted by one of the following substituents
(i) a halogen atom
(ii) a methyl group
(iii) a halogen-substituted methyl group
(iv) a methoxy group;

(III) a derivative of formula (I) wherein any two of the lateral positions on any one of the benzene rings is bridged by a fused aromatic ring forming a naphthalene structure;
wherein
A is an azo or azoxy linkage group
n_1 and n_2 are integers in the inclusive range 0 to 4 and Y_1 and Y_2 are each one of the following
(i) hydrogen
(ii) OR_1 where R_1 is an alkyl or arylalkyl group
(iii)

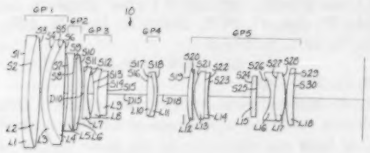


wherein R_2 and R_3 are each one of the following:
a simple alkyl or substituted alkyl group or an alkylene group forming a reduced hetero-aromatic system with the terminal aromatic ring.

4,145,115
ZOOM LENS

Ellis I. Betensky, Willowdale, Canada, assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Mar. 23, 1977, Ser. No. 780,257
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—184 12 Claims

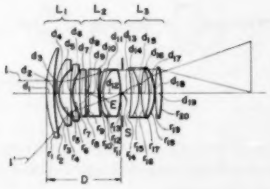


1. A zoom lens comprising from the object end a foremost positive focusing group consisting of two doublets of positive power movable axially of said lens, and further comprising in succession a stationary group of weak optical power a variator group and a compensator group both movable axially of the lens at different rates to vary the equivalent focal length thereof, and a stationary master lens.

4,145,116
LARGE APERTURE ULTRA WIDE ANGLE PHOTOGRAPHIC LENS SYSTEM

Yoshitsugi Ikeda, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,751
Claims priority, application Japan, Apr. 27, 1976, 51-47289
Int. Cl.[2] G02B *13/04*
U.S. Cl. 350—214 3 Claims



1. A large-aperture ultra-wide angle photographic lens system comprising a first positive meniscus lens component, a second negative meniscus lens component, a third negative meniscus lens component, a fourth lens component consisting of at least one single lens element, a fifth positive cemented lens component, a sixth negative cemented lens component, a seventh positive meniscus lens component and a eighth positive lens component, and said lens system satisfying the following conditions:

$$5 < r2/r3 < 7 \quad (1)$$

$$0.05 < r6/r7 < 0.2 \quad (2)$$

$$|r13/r14| < 0.2, r13 < 0 \quad (3)$$

$$1.5f < D < 1.7f \quad (4)$$

$$|n8 - n9| < 0.15, n9 > n8 \quad (5)$$

wherein the reference symbols r2, r3, r6, r7, r13 and r14 represent radii of curvature on the image side surface of said first lens component, the object side surface of said second lens component, the image side surface of said third lens component, the object side surface of said fourth lens component, the image side surface of said fifth lens component and the object side surface of said sixth lens component, the reference symbol D designates distance as measured from the object side surface of said first lens component to the image side surface of said fifth lens component, the reference symbols n8 and n9 denote refractive indices of the respective object side and image side element of said sixth lens component and the reference symbol f represents focal length of the entire lens system as a whole, and said fourth lens component consisting of two lens elements and having the following numerical data:

f = 100 F/2 Field Angle 92° B.f. = 177.3

r1 = 205.76			
	d1 = 18:60	n1 = 1.6393	ν1 = 44.9
r2 = 529.22			
	d2 = 0.60		
r3 = 101.55			
	d3 = 6.28	n2 = 1.734	ν2 = 51.5
r4 = 53.00			
	d4 = 23.26		
r5 = 228.01			
	d5 = 5.63	n3 = 1.7725	ν3 = 49.6
r6 = 62.26			
	d6 = 10.70		
r7 = 640.49			
	d7 = 15.86	n4 = 1.61659	ν4 = 36.6
r8 = ∞			
	d8 = 3.26		
r9 = ∞			
	d9 = 23.26	n5 = 1.61659	ν5 = 36.6
r10 = −2015.4			
	d10 = 0.47		
r11 = 110.68			
	d11 = 6.98	n6 = 1.6968	ν6 = 55.5
r12 = 68.42			
	d12 = 36.28	n7 = 1.5934	ν7 = 34.8
r13 = −170.22			
	d13 = 17.67		
r14 = −1046.6			
	d14 = 17.58	n8 = 1.72	ν8 = 43.7
r15 = −88.37			
	d15 = 6.98	n9 = 1.84666	ν9 = 23.9
r16 = 212.49			
	d16 = 10.00		
r17 = −232.53			
	d17 = 13.95	n10 = 1.713	ν10 = 53.9
r18 = −88.07			
	d18 = 0.47		
r19 = 459.97			
	d19 = 13.95	n11 = 1.72	ν11 = 50.3
r20 = −199.85			

r2/r3 = 5.21 D = 151.2 , r6/r7 = 0.097
n8 - n9 = 0.127 r13/r14 = 0.163

wherein the reference symbol f represents focal length of the entire lens system as a whole, the reference symbols r1 through r20 designate radii of curvature on the surfaces of the respective lens elements, the reference symbols d1 through d19 denote thicknesses of the respective lens elements and the airspace therebetween, the reference symbols n1 through n11 represent refractive indices of the respective lens elements, the reference symbols ν1 through ν11 designate Abbe's numbers of the respective lens elements, the reference symbol D designates distance as measured from the object side surface of said first lens component to the image side surface of said fifth lens component and reference symbol B.f represents back focal length.

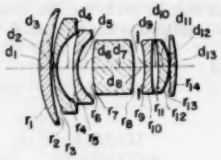
4,145,117
RETROFOCUS TYPE WIDE ANGLE LENS SYSTEM

Yoshitsugi Ikeda, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 732,182
Claims priority, application Japan, Oct. 15, 1975, 50-123272; Oct. 15, 1975, 50-123273
Int. Cl.[2] G02B *9/64*
U.S. Cl. 350—214 10 Claims

1. A retrofocus type wide-angle lens system comprising a first positive meniscus lens having a convex surface on the object side, a second negative meniscus lens having a convex surface on the object side, a third negative meniscus lens having a convex surface on the object side, a fourth biconvex lens, a fifth biconcave lens, a sixth positive meniscus lens having a

concave surface on the object side and a seventh biconvex lens, said lens system having the following numerical data:



$f = 100$ 1 : 2.8 Field Angle 75.3°
$f_B = 134.282$
$r_1 = 103.386$
$d_1 = 15.18$ $n_1 = 1.66446$ $\nu_1 = 35.8$
$r_2 = 198.802$
$d_2 = 1.79$
$r_3 = 115.085$
$d_3 = 4.34$ $n_2 = 1.58913$ $\nu_2 = 61.1$
$r_4 = 43.978$
$d_4 = 16.15$
$r_5 = 97.732$
$d_5 = 4.31$ $n_3 = 1.62299$ $\nu_3 = 58.1$
$r_6 = 40.676$
$d_6 = 18.25$
$r_7 = 82.085$
$d_7 = 46.71$ $n_4 = 1.69350$ $\nu_4 = 50.8$
$r_8 = -87.969$
$d_8 = 10.70$
$r_9 = 83.344$
$d_9 = 7.44$ $n_5 = 1.78472$ $\nu_5 = 25.7$
$r_{10} = 190.721$
$d_{10} = 6.61$
$r_{11} = -115.253$
$d_{11} = 8.57$ $n_6 = 1.65844$ $\nu_6 = 50.9$
$r_{12} = 50.919$
$d_{12} = 0.36$
$r_{13} = 513.004$
$d_{13} = 8.93$ $n_7 = 1.62299$ $\nu_7 = 58.1$
$r_{14} = -121.112$

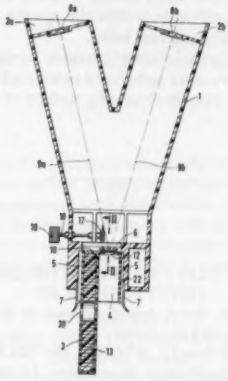
wherein the reference symbol f represents the total focal length of the lens system as a whole, reference symbol f_B designates the back focal length, the reference symbols r_1 through r_{14} denote the radii of curvature on the respective lens surfaces, the reference symbols d_1 through d_{13} represent thicknesses of the respective lenses and airspaces, the reference symbols n_1 through n_7 designate refractive indices of the respective lenses and the reference symbols ν_1 through ν_7 denote Abbe's numbers of the respective lenses.

4,145,118
VIEWING INSTRUMENT

Dieter W. Liedtke, Unterbösch, Hünenberg, Zug, Switzerland

Filed Oct. 29, 1976, Ser. No. 736,691
Int. Cl.[2] G02B *27/02*
U.S. Cl. 350—241 **5 Claims**

1. An instrument for the individual viewing of pictures disposed successively on a transparent film strip, comprising: a housing with a binocular viewing window; a housing aperture; a lens system enlarging the viewing angle of the instrument and located on the optical axis between the binocular viewing window and housing aperture, an endless strip forming said transparent film strip, a cassette having a magazine for receiving the major portion of said endless strip, said magazine having two flat sides arranged parallel to each other and spaced from each other by approximately the width of said endless strip, said endless strip being wound up in said magazine between said two flat sides and being guided in a closed loop out of the magazine and back into the same; a side chamber formed adjacent one of said flat sides of the magazine, said side chamber comprising a guiding wall provided with a picture aperture arranged laterally offset with respect to the magazine, said side chamber being open at a back side opposite the picture aperture, said film strip outside the magazine being held for viewing picture by picture along the optical axis between the binocular viewing window and the housing aperture; holding means for detacheably mounting the magazine at said housing, including means for aligning the picture aperture with the optical axis between said binocular viewing window and said housing aperture; and guiding means comprising a transporting device supported at the housing and actuable from the outside for moving the film strip loop in front of the picture aperture, and a back support formed at the guiding wall, said guiding device

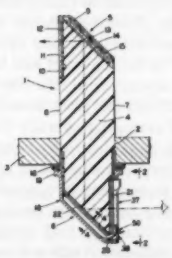


comprising means for guiding the loop of the endless strip such that the same intersects the optical axis only once within the area of the picture aperture arranged at the guiding wall, whereby an illumination ray path is formed through said open back side of the side chamber to the picture aperture providing unhampered access of light to the picture aperture for viewing an individual picture on a section of said film strip loop with said section disposed and guided on said guiding wall.

4,145,119
PERISCOPE BLACKOUT BLIND CONSTRUCTION

Gerald Tausch, Salem, Ohio, assignor to Miller - Holzwarth, Inc., Salem, Ohio

Filed Oct. 11, 1977, Ser. No. 840,673
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—301 **12 Claims**



1. A periscope construction including:
(a) a block of optical material having eyepiece and object viewing sections located at generally opposite ends of said block, said eyepiece section having a viewing surface and a reflective surface forming an included acute angle therebetween;
(b) a protective housing enclosing portions of the eyepiece viewing section;
(c) opening means formed in the housing and aligned with the viewing surface;

(d) the housing having walls spaced from the reflective surface forming chamber means between said walls and reflective surface within the housing;

(e) frame means removably mounted on the housing and defining at least a portion of the viewing surface opening means, said frame means being spaced from the eyepiece viewing surface forming a pair of spaced guide channels between said frame means and eyepiece viewing surface;

(f) flexible opaque sheet means slidably mounted on the housing and movable within the spaced guide channels and the chamber means; and

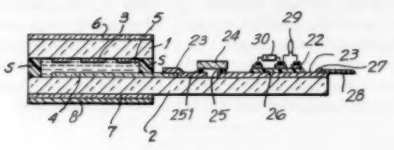
(g) said sheet means being movable across the opening means between open and closed positions for exposing and covering the eyepiece viewing surface of the transparent block.

4,145,120

ELECTRONIC TABLE CALCULATOR USING LIQUID CRYSTAL DISPLAY

Kanemitsu Kubota, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 17, 1976, Ser. No. 724,127
Claims priority, application Japan, Sep. 19, 1975, 50-113264
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—332 **6 Claims**



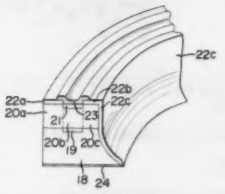
1. An electronic device incorporating a liquid crystal display cell and an integrated circuit chip in the form of a C-MOS-IC associated with said display cell and electrically connected therewith comprising a liquid crystal display cell formed from a pair of spaced plates; a liquid crystal material intermediate said plates; a spacer positioned intermediate said plates and surrounding said liquid crystal material, one of said plates extending laterally beyond said spacer; first and second electrodes respectively positioned on facing surfaces of said plates, said second electrodes positioned on the surface of said one plate including regions extending along the surface of said one plate past said spacer to the region of said one plate extending laterally beyond said spacer; third thin film electrodes formed on the same surface of said one plate as said second electrodes in the region thereof extending laterally from said spacer, at least a portion of said third electrodes being in electrical connection with said second electrodes and at least a portion of said third electrodes terminating in contact regions, said integrated circuit chip being electrically connected to said contact regions by face-down bonding, said integrated circuit chip having a surface and including contacts formed on said surface in a predetermined array, said contact regions of said third electrodes being formed in an array corresponding to the contacts of said integrated circuit chip for registration therewith; and further including a layer, formed of a material chosen from the group including gold, nickel and copper, formed on each said contact of said integrated circuit chip and each said contact region of said third electrodes, said contacts and contact regions being joined by thermobonding through the use of solder, said solder being selected from the group of materials including nickel, copper, gold, iron, or an alloy including them.

4,145,121

LIGHT MODULATOR

Susumu Hata, Tokorozawa; Kenji Kajiyama, Kodaira, and Yoshihiko Mizushima, Fuchu, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Aug. 3, 1976, Ser. No. 710,961
Claims priority, application Japan, Aug. 9, 1975, 50-97018
Int. Cl.[2] G02F *1/00*
U.S. Cl. 350—355 **10 Claims**



1. A light modulator, comprising:

a semiconductor substrate,

a curved optical waveguide comprising an elongated arcuate semiconductor layer of substantially intrinsic material formed on said semiconductor substrate and curved with a predetermined radius of curvature, one end of said curved optical waveguide being an input end and the other end being an output end,

first and second carrier density changing metallic electrodes disposed on said substrate and said elongated arcuate layer respectively, for changing the dielectric constant of said curved optical waveguide by injecting both electrons and holes into a region of said arcuate semiconductor layer, and

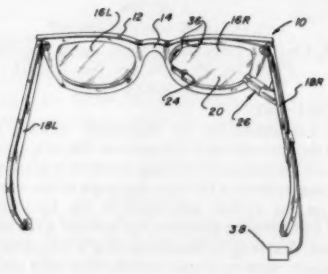
a semiconductor electrode layer contiguous with at least one of said pair of metallic electrodes.

4,145,122

METHOD AND APPARATUS FOR MONITORING THE POSITION OF THE EYE

George A. Rinard; Donald E. Rugg, both of Denver, and Dale A. Steffen, Aurora, all of Colo., assignors to Colorado Seminary, Denver, Colo.

Filed May 31, 1977, Ser. No. 801,459
Int. Cl.[2] A61B *3/10*
U.S. Cl. 351—7 **15 Claims**



1. For use in combination with a pair of eyeglasses of the type having lenses mounted within a frame that includes a centrally-located nosepiece and bows extending rearwardly from the opposite side margins thereof, the eye position monitor which comprises: infrared reflective means coated upon a surface of one lens so as to cooperate therewith in defining a mirror; a source of infrared light mountable upon said eyeglass frame to one side of said one lens, said source being effective when properly positioned to direct a beam of infrared light against the surface of said mirror and reflect same onto the

cornea of the eye of a person wearing said eyeglasses so as to reproduce a virtual image therein that changes position upon movement of the eye relative to the head; and, means comprising an infrared sensitive detector mountable upon said frame on the opposite side of said one lens from the side occupied by the source of infrared light, said detector being positionable to receive the reflection off the surface of the mirror of said virtual image within the eye, and said detector including a sensor responsive to infrared light operative in the presence of said reflected image to generate an output signal.

4,145,123

PERIMETER

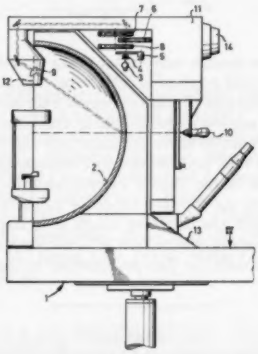
Wilhelm E. Krahn, Hamburg, and Manfred Born, Munich, both of Fed. Rep. of Germany, assignors to Optische Werke G. Rodenstock, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 609,485, Sep. 2, 1975. This application Mar. 16, 1977, Ser. No. 778,086

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1974, 2441578

Int. Cl.[2] A61B *3/02*

U.S. Cl. 351—24 **27 Claims**



17. In a perimeter including at least one projector for projecting a beam of light to a perimetric surface, filter means including a plurality of filters for attenuating said beam of light, drive means for changing said plurality of filters, and electronic control means for controlling said perimeter, the improvement comprising said electronic control means including means for activating said drive means and switching at least one filter during a predetermined time interval, means for providing light and dark intervals of said projected light, said predetermined time interval occurring only during said dark interval, and means for adjusting the length of said dark interval.

4,145,124

SCREW FOR EYE GLASS FRAMES

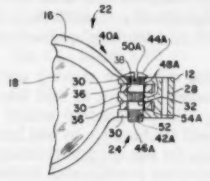
William C. Weisgerber, 3316 Savage Rd., Sarasota, Fla. 33581

Continuation-in-part of Ser. No. 667,210, Mar. 15, 1976, abandoned. This application May 19, 1977, Ser. No. 798,454

Int. Cl.[2] G02C *5/14, 5/00*; F16B *23/00*

U.S. Cl. 351—121 **9 Claims**

1. A screw and hinge assembly for fastening an eye glass temple piece to a front eye glass frame, said screw and hinge assembly comprising: hinge means including first and second hinge members, said first hinge member affixed to the temple piece, said second hinge member affixed to the front eye glass frame, screw means having a screw head portion and a screw shank portion integrally attached to one another, said screw shank portion having a threaded screw portion and a serrated screw portion integrally formed in the exterior surface thereof, said serrated screw portion having a taper between said screw head portion and said threaded screw portion, at least one first aperture means formed within said first hinge member and configured to receive said screw means, at least one second aperture means formed within said second hinge member and configured to receive said screw means, said screw means disposed to extend concurrently into both said first aperture



means and said second aperture means whereby said first hinge member and said second hinge member are secured in movable, mating engagement with one another, said serrated portion disposed in locking engagement with the walls of one of said first and second aperture means whereby said screw means cannot work itself loose from said hinge means.

4,145,125

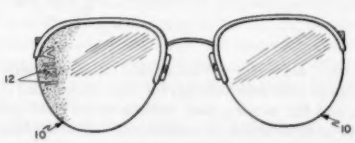
EYEGLASS LENS WITH INDICIA AND METHOD OF MAKING SAME

Hani Chika, 2975 Laurel St., #16, San Diego, Calif. 92104

Filed Jul. 20, 1977, Ser. No. 817,232

Int. Cl.[2] G02C *7/02, 7/10*

U.S. Cl. 351—165 **8 Claims**



1. An eyeglass lens comprising:

(a) a body made of a synthetic material;

(b) said body having a first portion and a second portion, at least one of said portions having dye deeply absorbed therein and being visually distinct from the other of said portions;

(c) said first portion being adjacent the periphery of said lens and being substantially surrounded by said second portion such as to define a substantially integral indicia-forming area on said lens which is generally imperceptible to the wearer of said lens but visible to observers as decorative or identifying indicia.

4,145,126

FILM CASSETTE SENSING AND RETAINING UNIT

John P. Bagby, Lake Forest; Kenyon A. Hapke, Libertyville, and Thomas R. Wells, Des Plaines, all of Ill., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 28, 1973, Ser. No. 374,282

Int. Cl.[2] G03B *23/02*

U.S. Cl. 352—74 **7 Claims**

1. In an electrically energizable film handling apparatus having a control system for controlling plural film handling modes and being adapted to receive a film cassette having a cassette latching aperture therein, a cassette sensing and retaining unit comprising:

a housing forming a slot for receiving said cassette;

latching means for engaging said cassette in response to completed insertion of said cassette into said slot for latching said cassette in position in said slot during operation of said film handling apparatus;

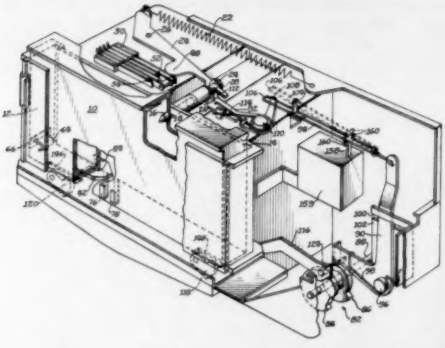
energization switch means for effecting energization of said apparatus incident to said engagement of said cassette by said latching means;

said latching means comprising:

an elongate latching pin mounted for co-axial alignment with said cassette latching aperture when said cassette is completely inserted into said slot, said latching pin being longitudinally movable between a latch position engaged in said latching aperture and a retracted position;

spring loaded means for moving said latching pin from said retracted position to said latch position and for actuating said energization switch means incident to moving said latching pin to said latch position; and

trigger means for engaging and retaining said latching pin in said retracted position and, responsive to completed insertion of a cassette into said slot, for releasing said latching pin for movement to said latch position; and



reset and eject means for retracting said latching means from engagement with said cassette, for deactuating said switch means, and for moving said cassette to an eject position incident to termination of operation of said film handling apparatus, said reset and eject means comprising:

first cam-operated means for moving said latching pin from said latch position to said retracted position against the force of said spring-loaded means thereby de-actuating said switch means and enabling said trigger means to engage and retain said latching pin in said retracted position;

second cam-operated means for engaging and moving said cassette to said eject position; and

timing cam means for effecting correlated operation of said first and second cam-operated means incident to termination of operation of said film handling apparatus.

4,145,127

FILM TRANSPORT AND CONTROL MECHANISM FOR MOTION PICTURE PROJECTORS

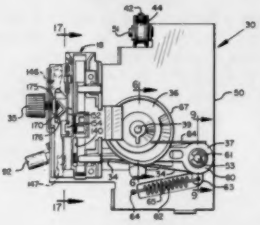
Donald I. Loofbourow, Canby, and Robert E. Lach, Beavertown, both of Oreg., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,646

Int. Cl.[2] G03B *41/00, 1/48*

U.S. Cl. 352—79 **24 Claims**

1. A modular film transport and control mechanism for selectively advancing perforated motion picture film of different frame formats past the optical axis of a projector comprising, in combination, a module plate adapted to be installed within the projector; a film gate assembly having a passageway for the film and a pair of projection apertures corresponding in size to the frames of the different film formats; said gate assembly being slidably disposed on the module plate for selective movement to align one or the other of said apertures with the optical axis; a film transport shuttle pivotally mounted on the module plate having a right angle claw member at one end for engagement with the perforations of the film and a cam follower extending perpendicularly at substantially a midpoint thereof; a unitary drive cam rotatably disposed on the module plate having a cam face with at least two concentric cam sections corresponding to the forward and still modes of projection, and an outer peripheral cam surface adapted to slidably engage the cam follower on the shuttle to impart reciprocal motion thereto in a direction parallel to the film path; and shifter means pivotally disposed on the module plate between the shuttle and the drive cam face and having camming means in contact with both to transmit reciprocal motion from the



cam face to the shuttle; said shifter being selectively movable between a forward position in which the camming means is in engagement with one of said concentric cam sections to transmit reciprocal motion to the shuttle in a direction perpendicular to the film path to move the claw into and out of engagement with the film perforations in synchronization with the parallel motion of the shuttle to effectuate incremental film advancement in the forward mode of projection, and a still position in which the camming means is in engagement with the other concentric cam section to retain the shuttle claw out of engagement with the film perforations in the still mode of projection.

4,145,128

DEVICE FOR CONTROLLING A CAMERA TIMING MEANS AS A FUNCTION OF FILM SPEED

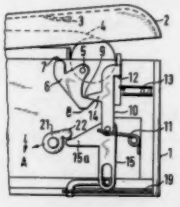
Karl H. Lange, Bünde, Fed. Rep. of Germany, assignor to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG, Bünde, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,328

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 7703901[U]

Int. Cl.[2] G03B *7/18*

U.S. Cl. 354—21 **9 Claims**



1. An improved apparatus for conrolling camera exposure regulating means including an activatable neutral density filter and electrical shutter timing control means or equivalent mechanical means for a rear loading film cartridge type camera which accepts speed coded film cartridges, said apparatus comprising a sensing means slidably mounted in the camera housing for sensing the speed code on a film cartridge, pivotable means cooperable with said sensing means for finally positioning said sensing means, said pivotable means being operatively responsive to enclosure of the film cartridge in the

camera housing, said pivotable means including a first supportive surface and a second depressing surface, said pivotable means being engageable with said sensing means along said first or second surface thereof corresponding to the position of said sensing means, said first surface of said pivotable means engaging said sensing means when said sensing means is in a corresponding position, said second surface of said pivotable means engaging said sensing means when said sensing means is in a corresponding position and regulable intermediate means responsive to said sensing means for regulating the disposition of the neutral density filter between inactive and active exposure regulating positions.

4,145,129

PHOTOGRAPHIC INFORMATION DISPLAY APPARATUS FOR CAMERA

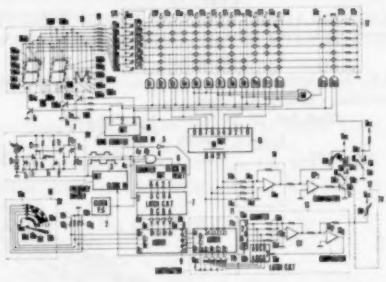
Masaharu Kawamura, Kawasaki; Nobuaki Sakurada, Yokohama; Nobuhiko Shinoda; Hiroyasu Murakami, both of Tokyo, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1978, Ser. No. 878,598

Claims priority, application Japan, Feb. 28, 1977, 52-21063

Int. Cl.[2] G03B *7/08, 17/18;* H05B *41/14*

U.S. Cl. 354—23 D **10 Claims**



1. A photographic information display apparatus for a camera, comprising:

(a) an encoder for encoding a plurality of photographic informations;

(b) a plurality of driving signal transfer lines for transferring an output signal from said encoder;

(c) at least one first display chip having a plurality of segments connected to said driving signal transfer lines for displaying the photographic informations;

(d) a second display chip having at least one segment connected to at least one of said driving signal transfer lines for displaying said photographic informations encoded by the encoder, the second display chip being provided with a number of segments less than the segments of the first display chip; and

(e) a third display chip connected to at least one of the driving signal transfer lines, to which the segments of the second display chip are not connected, for displaying the photographic informations encoded by said encoder.

4,145,130

CURRENT SUPPLY RELEASE SYSTEM FOR MAGNETIC MECHANISM

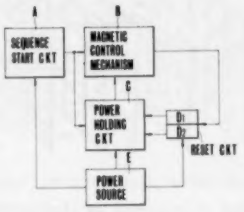
Masami Shimizu, Tokyo; Hiroshi Aizawa, Machida; Masayoshi Yamamichi, Kawasaki; Yukio Iura, Yokosuka; Masanori Uchidoi, Kawasaki, and Tokuichi Tsunekawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1976, Ser. No. 711,294

Claims priority, application Japan, Aug. 5, 1975, 50-95121

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—51 **7 Claims**



1. A photographic camera comprising:

(a) a power supply source for producing a driving circuit;

(b) magnetic control mechanism means having at least an electromagnet and an operation control circuit for the electromagnet and for controlling an exposure of the camera;

(c) a shutter release means;

(d) power supply holding means connected between the power supply source and the magnetic control mechanism for controlling the supply of the driving current from the power supply source and the magnetic control mechanism, said power supply holding means holding the supply of the driving current in response to the operation of the shutter release means;

(e) a battery checking button provided in the camera; and

(f) resetting means connected functionally to the power supply holding means and responsive to the operation of the battery checking button for forcibly resetting the power supply holding means so that the supply of the driving current is interrupted after the exposure sequence of the camera is interrupted.

6. A photographic camera comprising:

(a) a power supply source for producing a driving current;

(b) magnetic control mechanism means having at least an electromagnet and an operation control circuit for the electromagnet and for controlling an exposure of the camera;

(c) shutter release means;

(d) power supply holding means connected between the power supply source and the magnetic control mechanism for controlling the supply of the driving current from the power supply source to the magnetic control mechanism, said power supply holding means holding the supply of the driving current in response to the operation of the shutter release means;

(e) first resetting means for resetting the power supply holding means so that the supply of the driving current is interrupted when an exposure sequence of the camera is completed;

(f) short-circuit means, including at least one capacitor to be connected in parallel with the power supply source after the exposure sequence of the camera is interrupted; and

(g) means for disconnecting for a short time the power supply source from the power supply holding means in response to the voltage change at the output terminal of the short-circuit means to reset the power supply holding means.

4,145,131

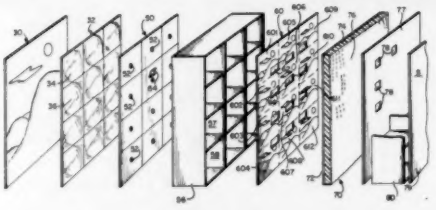
COMPACT CAMERA AND VIEWER APPARATUS

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Continuation of Ser. No. 594,645, Jul. 10, 1975, abandoned, which is a division of Ser. No. 515,343, Oct. 16, 1974, Pat. No. 3,950,769. This application Nov. 15, 1977, Ser. No. 851,725

Int. Cl.[2] G03B *35/08, 1/00;* G02B *27/00*

U.S. Cl. 354—115 2 Claims



1. A method of recording by photography, including the steps of,

(a) simultaneously forming N non-overlapping similar images of an object by permitting light from an object to fall upon N objective lenses of a lens array and allowing the light passing through each of the N lenses to fall on an opaque scene mask which is located at a distance from the lenses substantially equal to their focal length,

(b) selecting one portion less, than the whole, from each of the N images, to thereby define N portions, each of the N portions being non-homologous with respect to the image, the N portions being spaced apart from each other so that their borders do not touch each other, by placing N spaced apart apertures in said opaque scene mask, the N apertures each being smaller than each image, each aperture corresponding to a single one of said objective lenses,

(c) photographically recording each of the N portions by placing a photographic emulsion on the side of said opaque mask remote from said objective lenses, spaced from but contiguous to said opaque plate, and allowing light passing through the N apertures to fall upon the emulsion to thereby form a distributed set of exposed emulsion areas corresponding to a scene being recorded,

(d) step b) being carried out by so arranging the N apertures over the opaque scene mask such that when the distributed set of exposed emulsion areas is projected, after photographic fixing thereof through inverting lenses for readout, a congruent, positive image is formed on a viewing screen.

4,145,132

OPENING AND CLOSING DEVICE OF A CAMERA SHUTTER MECHANISM

Eiichi Onda; Mitsuo Koyama; Tadashi Nakagawa; Masanori Watanabe, and Ichiro Nemoto, all of Yotsukaido all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Dec. 16, 1976, Ser. No. 751,161

Claims priority, application Japan, Dec. 19, 1975, 50-171631[U]; Dec. 19, 1975, 50-171632[U]

Int. Cl.[2] G03B *9/36*

U.S. Cl. 354—249 3 Claims

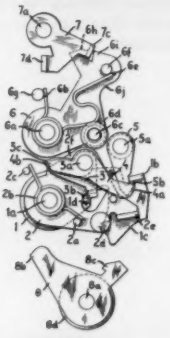
1. In a camera shutter mechanism for use with a camera shutter of the type having opening shutter blades and closing shutter blades;

a shutter opening member movable between a closed position corresponding to a closed shutter and an open position corresponding to an open shutter;

a shutter closing member mounted for pivoting about a first axis between an open position corresponding to an open shutter and a closed position corresponding to a closed shutter;

a movable driving member mounted for pivoting about a second axis and including coupling means for releasably coupling said driving member to said shutter opening member to permit moving of said shutter opening member by moving of said driving member and for releasing said shutter opening member from said driving member when said shutter opening member is moved from the open to the closed position;

first biasing means for biasing said driving member to move



said shutter opefiing member from the closed to the open position to initiate exposure;

second biasing means for biasing said shutter closing member to move from the open to the closed position to terminate exposure; and

means mounted on said driving member responsive to movement of said shutter closing member to the closed position for returning said shutter opening member to the closed position.

4,145,133

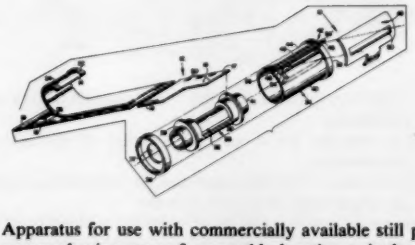
FILM ASSEMBLAGE OF THE SELF-DEVELOPING TYPE TOGETHER WITH APPARATUS FOR PROCESSING THEREOF

Richard R. Wareham, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 25, 1977, Ser. No. 818,410

Int. Cl.[2] G03B *17/26*

U.S. Cl. 354—275 8 Claims



1. Apparatus for use with commercially available still picture cameras having means for operably locating a single reel cartridge of film of the non-self-processing type which is adapted to have sequentially recorded thereon a plurality of discrete subject images when utilized in such cameras and which has a generally cylindrical housing structure of a given diameter and a given length with an elongated light sealed opening extending therethrough, a spool mounted in the housing structure for rotation about an axis extending lengthwise of the housing structure and including a central substantially uninterrupted axle portion around which an elongated strip of such photographic film is coiled for storage intermediate the central axle portion of the spool and the inner surface of the

cylindrical housing structure with a free end of the film strip extending through the opening, said apparatus comprising:

a generally cylindrical housing structure of substantially said given diameter and given length and having an elongated light sealed opening extending lengthwise thereof;

a spool mounted in said housing structure for rotation about an axis extending lengthwise of said housing structure, said spool including a central axle portion having a recess formed therein of given depth and width;

an elongated strip of unprocessed photosensitive self-developing film having a sufficient length to accommodate the sequential recording thereon of a plurality of discrete subject images, a width greater than the length of said spool recess and a first end connected to said spool, said self-processing film strip being coiled around said spool's central axle portion with its other end extending through said housing structure's opening, said self-processing film strip including a pod of processing fluid sufficient to process the entire photosensitive surface of said self-processing film strip, said pod being located adjacent said first end of said self-processing film strip and dimensioned to be seated in said recess of said spool's central axle portion so that substantially the same length of said self-processing film strip can be stored around said central axle portion within said cylindrical housing structure as could be so stored in said apparatus with said pod of processing fluid removed therefrom and whereby the same camera may be employed to effect the exposure of said self-processing film strip as well as the type of film heretofore utilized therein; and

means for precluding said other end of said self-processing film strip from being drawn inside of said housing structure whereby said self-processing film strip may be withdrawn from said housing structure for sequential exposure in the camera and thereafter rewound back inside of said housing structure to facilitate its removal from the camera with said other end of said film strip being available to enable subsequent processing of said film strip outside of the camera.

releasably engaging a recess formed in the camera on which the device is mounted.

4,145,134

DEVICE FOR MOUNTING ELECTRONIC FLASH ON CAMERA

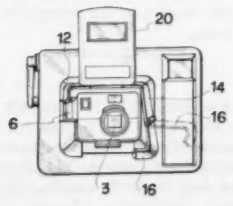
Yoshio Kogure, and Shuji Ozawa, both of Tokyo, Japan, assignors to Sunpak Corporation, Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,187

Claims priority, application Japan, Aug. 18, 1977, 52-109568[U]

Int. Cl.[2] G03B *11/00, 17/56*

U.S. Cl. 354—295 **8 Claims**



1. A device for mounting an electronic flash on a camera, comprising a mounting portion for mounting an electronic flash thereon, a short side portion extending from one end of the mounting portion substantially at right angles thereto and provided at its end with a first locking portion, a relatively longer side portion extending from the other end of the mounting portion substantially at right angles thereto and provided at its end with a hinged member having an end portion disposed at a substantially right angle with locking means adapted for

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4,145,135

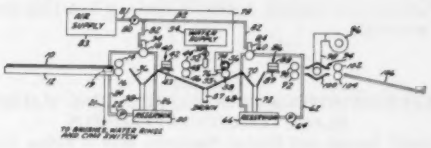
LITHOGRAPHIC PLATE PROCESSOR

George M. Sara, Garden Grove, Calif., assignor to Beach Manufacturing Corporation, Huntington Beach, Calif.

Filed Sep. 1, 1977, Ser. No. 829,645

Int. Cl.[2] G03D *3/10*

U.S. Cl. 354—317 **9 Claims**



1. In a lithographic plate processor, a fluid feed apparatus comprising:

a fluid feed tube adapted for substantially continuous fluid feed therethrough, said tube having a plurality of spaced fluid dispensing orifices through a side wall of said tube and corresponding diametrically oppositely located bores therethrough;

a plurality of fluid metering valve members passing through said bores in said side wall opposite said orifices and movable into fluid metering arrangement with said orifices;

fluid actuating means operatively connected to said valve members on said side wall opposite said orifices, said actuating means including a piston connected to said valve member and sealingly movable in a piston chamber, said piston being normally spring biased to cause said valve members to close said orifices; and

pneumatic pressure means connected to said chamber opposite said spring for selectively pneumatically moving said piston and valve member to open said orifices.

4,145,136

SCANNING SYSTEM FOR AN ELECTROSTATIC COPYING APPARATUS

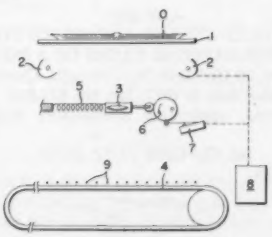
Toru Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1975, Ser. No. 640,284

Claims priority, application Japan, Dec. 23, 1974, 49-147793

Int. Cl.[2] G03G *15/24, 15/28*

U.S. Cl. 355—8 **1 Claim**



1. A copying apparatus comprising a stationary or movable original holder, flash lamp means for illuminating the entire surface of an original on said holder, a lens movable in a direction perpendicular to its optical axis, a movable photosensitive medium having an image bearing surface for being exposed to a light image of said original projected through said lens, a plurality of fixed corona wires disposed adjacent the surface of the photosensitive medium for charging or discharging the surface of said photosensitive medium simultaneously with the

exposure thereof to said light image, and means for establishing relative movement of said lens and photosensitive medium to satisfy the relation:

$$\left|\frac{V_1 - V_1'}{V_1}\right| \leq 1 ,$$

where V_1 is the velocity of movement of said photosensitive medium and V_1' the velocity of movement of the light image at the surface of said photosensitive medium, wherein said photosensitive medium is moved at a rate of at least 1mm. per 0.1mm of corona wire diameter during the time said flash lamp means is activated.

4,145,137

ELECTROPHOTOGRAPHIC REPRODUCING MACHINE BLADE CLEANING APPARATUS

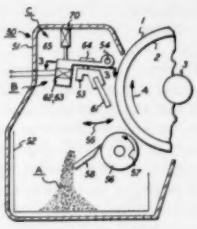
Ryuzoh Sunaga, and Kunimi Hasegawa, both of Ebina, Japan, assignors to Rank Xerox Limited, London, England

Filed Sep. 6, 1977, Ser. No. 830,727

Claims priority, application Japan, Oct. 8, 1976, 51-134877

Int. Cl.[2] G03G *21/00*

U.S. Cl. 355—15 **4 Claims**



1. In a blade cleaning apparatus for removing residual material from a moving imaging surface of a reproducing machine, said apparatus comprising: a blade for engaging said surface to remove said material; means for supporting said blade for movement between a position wherein it is in operative engagement with said surface, and a position wherein it is separated from said surface; the improvement wherein, said apparatus further comprises:

means for vibrating said blade when it is separated from said surface for shaking off said residual material and foreign material from said blade.

4,145,138

METHODS OF AND APPARATUS FOR PHOTOGRAPHING PAGES OF A BOOK

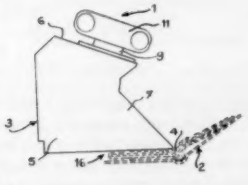
Gerald Mercure, 38 Duchesne St., Rimouski, Quebec, Canada

Filed Aug. 4, 1977, Ser. No. 821,832

Claims priority, application Switzerland, Aug. 5, 1976, 10112/76

Int. Cl.[2] G03B *27/32, 27/52*

U.S. Cl. 355—25 **26 Claims**



1. A method of photographing the pages of a book on at least one strip of film with a camera mounted on a support having a reference line thereon so as to produce an ordered sequence of exposures on the film which follow a sequence of pages in the book, comprising the steps of:

(a) opening the book to expose a set of first and second, sequential and adjacent pages separated by a seam,

(b) aligning the first page of the set with the camera by aligning the reference line of the support with the seam,

(c) photographing the first page to produce a first exposure on the film,

(d) aligning the second page of the set with the camera by aligning the reference line of the support with the seam after effecting a relative rotation of 180° between the book and the support,

(e) rotating the camera 180° relative to the support to maintain the relative direction of the film strip and the first page, and

(f) photographing the second page to produce an exposure on the film strip adjacent to the first exposure and oriented in the same direction as the first exposure.

6. Apparatus for photographing the pages of a book sequentially as the pages occur in the book with a camera having a strip of film therein which is indexed to sequentially register with an objective lens for providing a sequence of exposures, the apparatus comprising:

a support having a first opening for registration with a page being photographed and a second opening in fixed relation to the first opening for registration with the objective lens of the camera;

lighting means within the support for illuminating the page being photographed and for exposing the film;

mirror means within the support for reflecting a beam of the light from the lighting means to the page and for reflecting an image of the page through the objective of the camera with the beam of light;

framing means for aligning the first opening of the support with a book seam adjacent to the page to be photographed;

means for mounting the camera on the support to rotate about the axis of the objective lens while the objective lens is registered with the second opening;

means for indexing rotation of the camera through one hundred eighty degree intervals, whereby when the support and book are rotated one hundred eighty degrees with respect to one another to realign the framing means with the book seam in order to photograph an adjacent page, the film in the camera is rotated one hundred eighty degrees upon rotatably indexing the camera through one hundred eighty degrees so that the image of the adjacent page is oriented the same as that of a previously photographed page; and

indicating means on the support for aligning with indicating means on the camera to display the relative rotational position of the camera with respect to the support and therefore with respect to the orientation of the framing means and book.

4,145,139

ZIG ZAG SCANNING DENSITOMETER WITH BASE LINE AND IMPURITY CORRECTION

Kengi Nakamura, and Hiroshi Yamamoto, both of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Aug. 29, 1977, Ser. No. 828,545

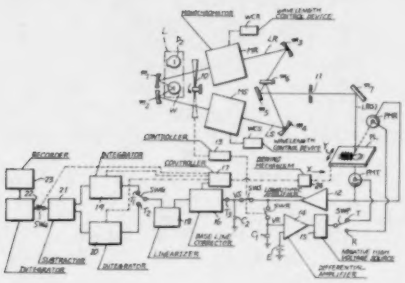
Claims priority, application Japan, Aug. 31, 1976, 51/117454[U]

Int. Cl.[2] G01N *21/22*

U.S. Cl. 356—73 **10 Claims**

1. A densitometer comprising: means for projecting monochromatic light onto a sample spot developed on a supporting medium; scanning means for effecting a relative zigzag movement between said monochromatic light and said supporting medium so that said monochromatic light scans along a zigzag locus a predetermined area of said supporting medium including said sample spot; photoelectric means for detecting the intensity of the light from said scanned area to produce a first

electrical signal corresponding to said intensity of said light; first integrating means for integrating said first electrical signal produced during one scanning stroke when said light scans a predetermined area of said supporting medium before said sample spot, said area including impurities other than the component of said sample spot; second integrating means for integrating said first electrical signal produced during each scanning stroke while said light scans said sample spot; and means for subtracting the result of said integration by said first integrating means from the result of said integration by said second integrating means to produce a second electrical signal corresponding to the result of said subtraction.

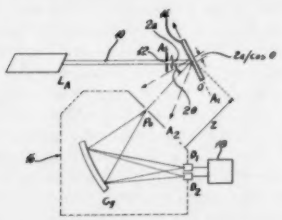


4,145,140

MEASUREMENT OF SURFACE ROUGHNESS

Hitoshi Fujii, 770 Belmont, Apt. 106, Ste-Foy, Quebec City, Quebec, Canada (G1V2W9)

Filed Jun. 15, 1977, Ser. No. 806,708
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—360 **9 Claims**



1. A method for measuring surface roughness, surface waviness, surface cracks, or any irregularities or flatnesses in a surface, including the following steps:

generating a spatially coherent polychromatic light having at last two different wavelengths and directing the polychromatic light at an optically rough surface in order to illuminate the same;

analyzing intensity variations in two speckle patterns formed at a light field scattered from the optically rough surface due to the two different wavelengths of the polychromatic light; and

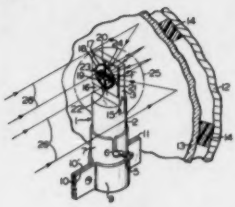
defining and evaluating a difference between intensities of the two speckle patterns as a function of surface roughness of the optically rough surface.

4,145,141

OPTICAL INSTRUMENT FOR SETTING THE POSITION OF A FILAMENT OF A SIGNAL LAMP

Peter M. Noble, Valencia, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Feb. 22, 1977, Ser. No. 770,644
Int. Cl.[2] F21V *19/02*
U.S. Cl. 356—123 **4 Claims**



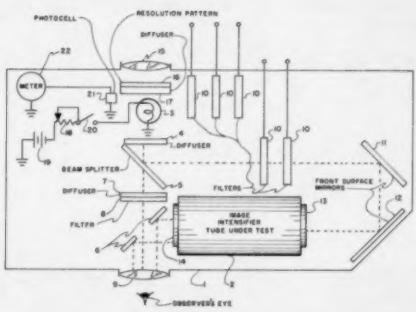
1. A lamp filament positioning device comprising, a base adapted to be placed into a lamp socket, and a sight means attached to said base for establishing the focal point of a smooth surface reflector and a lamp having a filament and a base adapted to be situated in the lamp socket in place of the filament positioning device so that the filament is located at the focal point of the smooth surface reflector for maximizing the illuminative efficiency of the lamp, and said sight means includes cross marks for focusing onto the surface of the smooth surface reflector.

4,145,142

APPARATUS FOR AND METHOD OF TESTING DIRECT-VIEW IMAGE INTENSIFIERS

Carl H. Mikeman, Fairfax City, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1977, Ser. No. 855,531
Int. Cl.[2] G01J *1/10*; H01J *39/12*; G01D *18/00*; G01R *31/24*
U.S. Cl. 356—229 **4 Claims**



1. A system for testing a direct-view image intensifier device having an input surface for receiving an input beam and an output surface for providing an output beam, the system including:

means for providing a test beam;

means for splitting said beam into two optical paths;

attenuator means;

wherein one of said paths includes said attenuator means between said splitter and said input surface of said device;

beam combining means;

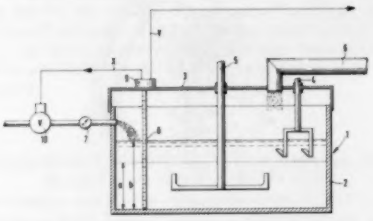
wherein the other optical path includes said combining means; and

whereby said combining means combines the output beam of said device with the test beam of the other optical path.

4,145,143
METHOD OF CONTROLLING THE PROPERTIES OF A MIXTURE

Albert M. Fontaine, 89, Mont, Comblain-au-Pont, Belgium

Filed Jun. 29, 1977, Ser. No. 811,043
Claims priority, application Luxembourg, Jul. 1, 1976, 75276
Int. Cl.[2] B28C 7/14
U.S. Cl. 366—40 13 Claims



1. A method for controlling the properties of a mixture of a material, a liquid, and at least one additive capable of causing volumetric expansion during formation of said mixture, comprising:

(a) forming a mixture of said material, said liquid, and said at least one additive capable of causing volumetric expansion of the resulting mixture during its formation;

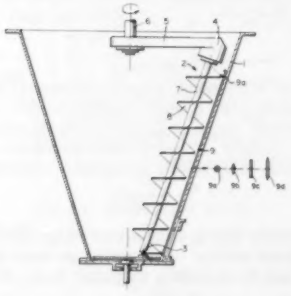
(b) continuously or intermittently measuring the speed and the absolute value of the resulting volumetric changes being undergone by the mixture during its formation; and

(c) controlling the addition of the quantities of said liquid and said at least one additive to the mixture as a function of the measurements made in step (b) and of previously established predetermined data until a mixture having the desired characteristics for its intended use is obtained.

4,145,144
WORM MIXER FOR A CONTAINER

Constant J. Nauta, Overveen, Netherlands, assignor to Nautamix Patent AG, Zug, Switzerland

Filed Sep. 27, 1976, Ser. No. 726,799
Claims priority, application Netherlands, Sep. 30, 1976, 7511535
Int. Cl.[2] B01F 9/22
U.S. Cl. 366—287 13 Claims

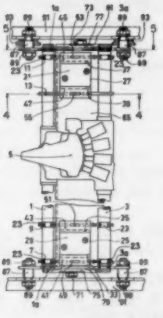


1. A mixing means for mixing the contents of a container, comprising: a worm mixer having a central shaft and helical blade means disposed therearound, said blade means comprising a plurality of convolutions, the radially outer periphery of said blade means being inwardly spaced from said container; band means disposed substantially parallel to said central shaft and pivotally mounted on and extending radially outwardly of said blade means; said pivotal mounting being adjacent the extremeties of the terminii of said blade means and of said band means, the intermediate portions of said band means being radially spaced from said blade means; means supporting said worm mixer relative to said container; means driving said shaft whereby said band means, in rotation, is caused to approach the inner surface of said container.

4,145,145
GUIDE FOR A PRINTING HEAD OF A PRINTING DEVICE

Lothar Haubrich, Eiserfeld, and Heinrich Durr, Wilnsdorf-Niederdielven, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,970
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617562
Int. Cl.[2] B41J 3/10
U.S. Cl. 400—124 3 Claims



1. A printing device which comprises: means for printing on a line including a printing head, a frame carrying said printing head, a guide for directing said printing head parallel to said printing line, said guide including first and second parallel round guide rods each having first and second ends, said first end of said first rod being proximate said first end of said second rod, first and second side plates, said first side plate extending transversely of said guide rods and engaging said first ends of each guide rod, said second side plate engaging said second ends of said guide rods, said guide plates being carried by said frame, said guide rods being maintained at a predetermined fixed distance from each other by at least first and second clamps cooperating with said first ends of said guide rods and third and fourth clamps cooperating with said second ends of said guide rods, said clamps each extending transversely of the longitudinal direction of said guide rods and being generally planar, said clamps being provided with two communicating bearing apertures, said guide rods each having a plurality of circumferential grooves, each groove cooperating with one of said bearing apertures, each clamp including an elongate, flexible bridge portion which is disposed intermediate said two bearing apertures of each clamp, said rods being positioned in part by an outward force produced by said flexible bridge portion, said device further including a supporting beam which is detachably carried by said frame of said printing device, said supporting beam extending parallel to said guide rods, said clamps being carried by said supporting beam, said device also including a clamping bracket cooperating with each of said clamps and both of said rods to provide detachable mounting therebetween.

4,145,146

RECORDING MEDIUM FEEDING APPARATUS FOR PRINTER

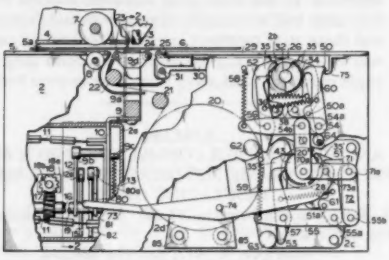
Yasuo Ohkawara, Sayama; Nagao Mizutani, Hachiouji; Toshio Kurihara, Tokorozawa, and Masamitsu Nojima, Tokyo, all of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

Filed Nov. 29, 1976, Ser. No. 745,978

Claims priority, application Japan, Nov. 29, 1975, 50-143052

Int. Cl.[2] B41J *15/00*

U.S. Cl. 400—614 **12 Claims**



1. A recording medium feeding apparatus for a printer comprising

(a) a frame;

(b) a feeding mechanism comprising feed means for feeding a recording medium to the printer, a feed shaft supported by said frame, a first ratchet wheel mounted on said feed shaft, feed driving means, a first pawl engaging said feed driving means and said first ratchet wheel providing forward rotation of said first ratchet wheel and a second pawl engaging said first ratchet wheel for preventing reverse rotation of said first ratchet wheel;

(c) a take up mechanism comprising take up means for taking-up the recording medium from the printer, a take up shaft connected to said frame, a second ratchet wheel mounted on said take up shaft, take up driving means, a third pawl engaging said take up driving means and said second ratchet wheel for providing a forward rotation of said second ratchet wheel and a fourth pawl for preventing a reverse rotation of said second ratchet wheel;

(d) coupling means consisting of a link mechanism for coupling said feed driving means with said take up driving means;

(e) power driving means connected to said coupling means for providing power through said coupling means to said feed driving means and said take up driving means; and

(f) means for storing resilient force including a first spring means coupled to said feed driving means, and a second spring means coupled to said take up driving means whereby resilient power for application to said first and third pawls for providing rotation of said first and second ratchet wheels is stored.

4,145,147

DISPENSING ORAL HYGIENE APPARATUS WITH VENTED MATERIAL CHAMBER

Joseph T. Schuck, 11735 Corry Pl., Philadelphia, Pa. 19154

Filed Jun. 20, 1977, Ser. No. 808,059

Int. Cl.[2] A46B *11/02*

U.S. Cl. 401—175 **2 Claims**

1. An oral hygiene appliance comprising:

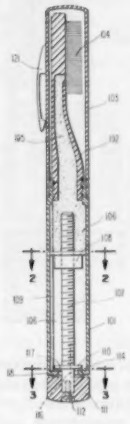
a cylindrical handle segment defining a cylindrical cavity therein, said handle terminating at one end in a threaded opening into said cavity, said handle having a port into said cavity at the opposite end thereof;

an application member, matably mountable to said threaded opening, said application member having a channel communicating with said cavity;

a piston, slidably and nonrotatably carried in said cavity, said piston engaging the side walls of said cavity;

an elongated screw; extending through said port and into said cavity, threadedly engaging said piston, and extending substantially through said cavity, said screw having a portion thereof extending outwardly from said port beyond said handle segment and being rotatable for translating said piston within said cavity;

a knob connected to said portion of said screw which extends outwardly from said port;



a flange connected to a portion of said screw within said cavity at said port end thereof;

means for spacing said flange away from said port end of said cavity;

means for spacing said knob away from said handle segment; and

a slot extending longitudinally along said screw from a point outwardly from the port end of said handle segment to a point within said cavity beyond the position of said flange and beyond said piston when said piston has been translated within said cavity to abut said flange.

4,145,148

BALL-POINT PEN FOR A LOW-VISCOSITY INK

Mitsuhiro Fukuoka, Osaka, Japan, assignor to Sakura Color Products Corporation, Osaka, Japan

Filed Jan. 7, 1977, Ser. No. 757,494

Claims priority, application Japan, Oct. 1, 1976, 51/133220[U]; Oct. 1, 1976, 51/133221[U]

Int. Cl.[2] B43K *7/00*

U.S. Cl. 401—209 **3 Claims**

1. A ball-point pen for use with a low-viscosity ink comprising:

a casing having forward and rearward ends;

a tip having forward and rearward ends, said tip being secured at said rearward end to said forward end of said casing;

a ball socket positioned at said forward end of said tip;

a ball rotatably received in said ball socket;

a reduced diameter axially extending passage formed in said tip having forward and rearward ends, said reduced diameter passage forward end communicating with said ball socket;

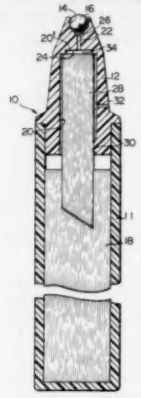
an axially extending capillary element passage formed in said tip having forward and rearward ends, said forward end of said capillary element passage communicating with said rearward end of said reduced diameter passage;

a chamber portion having a cross-sectional area intermediate that of said reduced-diameter passage and said capillary element passage and having forward and rearward ends,

said chamber portion being positioned between said rearward end of said reduced-diameter passage and said forward end of said capillary element passage, said chamber portion including a flat-faced shoulder at said rearward end and a transitional face at said forward end;

an ink source in said casing;

an axially elongated ink-feeding capillary element extending



from said ink source into said axially extending capillary element passage in said tip, said capillary element including a flat face at a forward end, said flat face being positioned in abuting engagement with the flat face of said shoulder; wherein a substantially closed chamber is defined, bounded by the intermediate cross-sectional area portion, the flat forward face of said ink feeding capillary element and said transitional face.

4,145,149

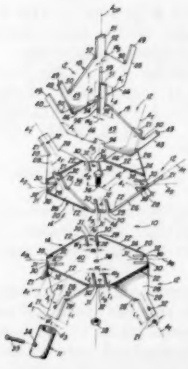
ANGLE PLATE CONNECTOR FOR TUBULAR MEMBERS

Wayne Ruga, 2163-D Coosawattee Rd., Atlanta, Ga. 30319

Continuation-in-part of Ser. No. 705,885, Jul. 16, 1976. This application Dec. 23, 1977, Ser. No. 863,718

Int. Cl.[2] F16B *7/04;* **F16D** *1/00, 3/00*

U.S. Cl. 403—217 **7 Claims**



1. An interlocking structural system comprising:

a plurality of tubular strut members defining a cental opening in the ends thereof of a prescribed diameter; and,

at least one connector for selectively interconnecting said plurality of tubular strut members, said connector including at least one base plate member, said base plate member having a plate axis and including a plurality of first tangs thereon lying in a common base plane normal to said plate axis and extending along first tang axes radially oriented with respect to said plate axis, and lying in said common base plane; and a plurality of second tangs thereon, each of said second tangs lying in a separate angle plane angled with respect to said common base plane and extending along second tang axes oriented generally radially with respect to said plate axis and lying in said angle plane; each of said first and second tangs having a size and shape such that the ends of said strut members will just slidably fit thereover so that those strut members inserted over said first tangs will be coaxially aligned with said first tang axes and those strut members inserted over said second tangs will be coaxially aligned with said second tang axes to angle outwardly and away from the common base plane.

4,145,150

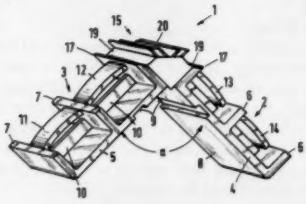
ANGULAR CORNER CONNECTING PIECE FOR PROFILED FRAME MEMBERS OF MULTI-SHEET INSULATING GLASS

Karl Rafeld, Kirnachstrasse 15-18, Altdorf-Ebenhofen, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,048

Int. Cl.[2] E04C *2/54*

U.S. Cl. 403—295 **3 Claims**



1. An angular corner connecting piece suitable for use with profiled frame members of multi-sheet insulating glass comprising:

a pair of longitudinally extending legs angularly disposed with respect to each other by an angle of 90° and insertable into the hollow crosswise adjacent profiled frame members of the multi-sheet insulating glass, each of said leg members including a base plate having at least a pair of spaced projecting ribs adapted to the cross-section of the profiled frame member and lying transverse to the direction of extension of said legs; and

a rigidifying head connecting said legs into an intergral unit, said head having walls lying parallel to said spaced ribs of said legs, springs extending between said ribs and walls and resiliently deformable upon insertion of the legs into the respective profiled frame member, said walls of said rigidifying head forming sealing grooves in said head defined by sealing lips on said walls, said grooves extending transversely to the direction of extension of said legs, said rigidifying head having an outer surface normal to said walls with an exposed edge inclined by 45° relative to the longitudinal extension of said legs, said head having pairs of guide ribs extending parallel to said sealing lips and enclosing angles of about 45°, respectively, 135° with the edge of said rigidifying head outer surface.

4,145,151

MANHOLE COVER AND FRAME WORK

William R. Helms, P.O. Drawer 918, Goldsboro, N.C. 27530

Filed Mar. 30, 1978, Ser. No. 891,866

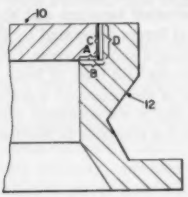
Int. Cl.[2] E02D *29/14*

U.S. Cl. 404—25 **2 Claims**

2. In the known combination of a load bearing access device

and a supporting frame for said device, said frame including a seat portion upon which the outer lower surface of said access device rests and a generally vertical shoulder portion having an inside diameter slightly greater than the outside diameter of said access device, the improvement which conprises

(a) said access device containing a plurality of spaced apart vertical passageways adjacent its circumference the circumferential periphery of each passageway encompassing both a portion of the outer periphery of said access device



and a portion of the inner periphery of said shoulder portion, the lower portion of each said passageway extending into the seat portion of the supporting frame and being at least partially threaded,

(b) a stud member in each passageway having

(1) a lower end that is threaded engaged with the threaded lower end of each passageway and

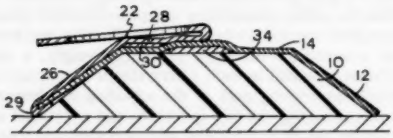
(2) an upper end that is level with the upper surface of said access device.

4,145,152

TEMPORARY HIGHWAY REFLECTOR COVER

Bobby L. Waugh, 30742 Saddleback Rd., Valley Center, Calif. 92082

Filed May 25, 1978, Ser. No. 909,358
Int. Cl.² E01F *9/06*
U.S. Cl. 404—71 **7 Claims**



1. A mask for a pavement-mounted highway reflector comprising:

(a) A cap dimensioned and shaped to fit over substantially the entire surface of a pavement-mounted highway reflector;

(b) A portion of the interior of said cap having adhesive applied thereto to connect said cap to a highway reflector;

(c) A pull-tab connected to said cap and having an end portion extending free of said cap, whereby subsequent to using said mask, same is rapidly removable by gripping and pulling said pull-tab to disengage said cap from a reflector.

4,145,153

METHOD OF REPLACING A ROADWAY

Eugene J. Fasullo, Tuxedo, and Daniel M. Hahn, Blauvelt, both of N.Y., assignors to The Port Authority of New York and New Jersey, New York, N.Y.

Filed Mar. 22, 1978, Ser. No. 888,959
Int. Cl.² E01C *21/00*
U.S. Cl. 404—73 **11 Claims**

9. A method of replacing an existing multiple-lane roadway, the method comprising the steps of:

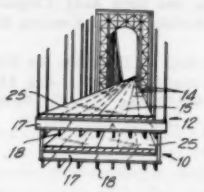
cutting at least one of the lanes of the roadway into rectilinear sections during a first nonpeak traffic period while maintaining traffic flow during said first period in another lane of the roadway, to form a plurality of cuts in said one lane extending in directions parallel and perpendicular thereto, the cuts in at least one of said directions being formed by sawing narrow slits in said roadway;

leaving the cut sections in place on said roadway for an extended period of time following said first nonpeak traffic period;

placing temporary traffic bearing members over the cuts in said one lane during the first nonpeak traffic period;

directing traffic over all of the lanes of the roadway during an ensuing peak traffic period;

preforming at a remote location rectangular roadway module;



applying a traffic bearing surface to the preformed roadway module at the remote location;

transporting the preformed roadway module with its traffic bearing surface to said one lane during a second nonpeak traffic period;

removing the traffic bearing members and the rectilinear sections from said one lane during said second nonpeak traffic period while maintaining the traffic flow during said second period in said other lane;

substituting the preformed roadway module for the removed rectilinear sections during said second nonpeak traffic period; and

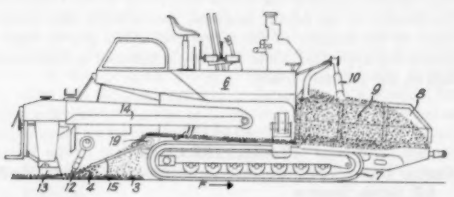
connecting the substituted module to an adjacent portion of the roadway during said second nonpeak traffic period.

4,145,154

NON-SKID HIGHWAY SURFACING

Claude M. Mingot, Ners-St-Chaptes, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Feb. 1, 1977, Ser. No. 764,660
Claims priority, application France, Feb. 13, 1976, 76 04668
Int. Cl.² E01C *19/00*
U.S. Cl. 404—81 **9 Claims**



1. A process of making a non-skid highway surface comprising the successive steps of:

making, in a mixing plant, a hot-mixed aggregate containing a variety of aggregate and sand sizes of at least two ranges of grading by melting a bituminous binder, heating aggregate chips and sand and mixing the heated chips and sand and the molten binder, and thereafter

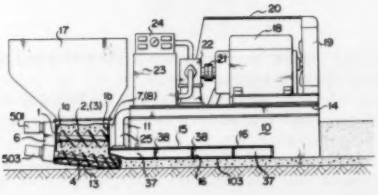
spreading onto a highway a layer of the hot mixed aggregate, said spreading step including the steps of screening

the hot mixed aggregate through a vibrating screen which is moved along said highway, and which has a mesh size that is larger than the upper limit of the lower grading range and smaller than the upper limit of the higher grading range, depositing the portion of the hot melt aggregate passing through the screen on said highway and depositing the material retained on the screen on top of the portion of the hot mixed aggregate which passed through the screen and was previously deposited on the highway.

4,145,155
PAVING MATERIAL EXTRUSION MOLDING APPARATUS

Koji Ogaki, Yokohama; Katsu Hirosawa; Masashi Kaminishi, both of Hiratsuka; Yoshinori Nozawa, Tokyo; Hiroshi Kakuta, Isehara, and Akio Aoki, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 11, 1977, Ser. No. 823,880
Claims priority, application Japan, Aug. 13, 1976, 51-107541; Aug. 13, 1976, 51-96140; Aug. 13, 1976, 51-96141
Int. Cl.[2] E01C *11/28*
U.S. Cl. 404—98 **11 Claims**



1. A paving material extrusion molding apparatus, comprising longitudinally and horizontally mounted frame means; power generating means mounted on said frame means, molding means detachably mounted on the lower surface of said frame means so that the paving material can be formed or molded in a predetermined cross-sectional shape corresponding to that of said molding means extending at right angles to the longitudinal axis thereof; a housing mounted on the front part of said molding means, said housing having a guide port and a top opening, said housing being connected to said molding means; paving material transfer means including a plurality of screw conveyors mounted in said housing; and hopper means adapted to be registered with and mounted on the top opening of said housing wherein the paving material supplied into the hopper means flows into said housing and is transferred by said screw conveyors into the molding means, wherein the combination of the weight of the apparatus with the extrusion force of the screw conveyors serves to increase the density of the paving material, and wherein the reaction force of the transfer of the screw conveyors can be used to propel the apparatus while the paving material is molded and laid on the ground surface.

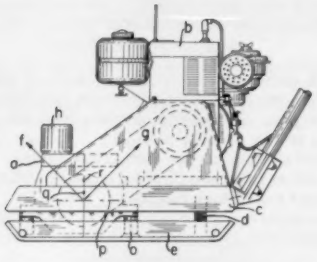
4,145,156
PLATE VIBRATOR

Gunnar Grane, Ljungby, Sweden, assignor to Dynapac Maskin AB, Solna, Sweden

Filed Aug. 15, 1977, Ser. No. 824,510
Claims priority, application Sweden, Aug. 24, 1976, 7609352
Int. Cl.[2] E01C *19/30*
U.S. Cl. 404—113 **5 Claims**

3. A plate vibrator for compacting soil, asphalt and similar materials, comprising a bottom plate, a vibrating element rigidly mounted on the bottom plate, a power unit resiliently mounted on the bottom plate for driving the vibrating element, the vibrating element comprising a rotating shaft, at least two eccentric weights mounted on the rotating shaft, and an adjusting mechanism for altering the phase positions of the weights in relation to each other, the adjusting mechanism interacting with the eccentric weights for the purpose of achieving both a vibratory compacting motion and movement of the plate in a forward or reverse direction on the surface that is to be compacted, characterized in that the vibrating element and power unit are positioned one behind the other on the bottom plate of the plate vibrator, whereby the distribution of the masses oscillating with the bottom plate is so selected that the common center of gravity of these masses, including the mass of the bottom plate, is situated between and above the lines of force of the centrifugal forces generated by the vibrating element when driving forward and in reverse, respectively, and in a vertical plane containing said lines of force,

wherein at least one of the eccentric weights is fixed on the shaft and at least one of the eccentric weights is mounted in such a way that it is rotatable in relation to the shaft and



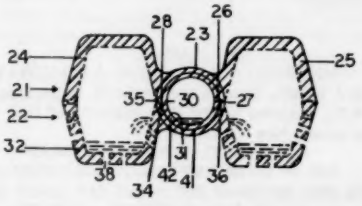
is arranged to rotate at the same speed as, but in the opposite direction to, the fixed eccentric weight, further comprising means for rotating said rotatable eccentric weight, said means comprising a chain transmission driven by said shaft, a gear driven by the chain transmission and journalled in the adjusting mechanism, and a gear rigidly mounted on the rotatable eccentric weight and interacting with the gear journalled in the adjusting mechanism, and

wherein the chain transmission comprises a chain sprocket journalled concentrically with the adjusting mechanism and attached to the fixed eccentric weight, a chain sprocket mounted in such a way that it can rotate on a radially protruding part of the adjusting mechanism, a chain connecting the two sprockets, and a sprocket shaft mounting the second-name of said sprockets, and wherein the gear journalled in the adjusting mechanism is rigidly mounted on the sprocket shaft.

4,145,157
MODULAR DRAIN FIELD SECTION

Daniel J. Lascelles, 744 Lake Winnemissett Dr., Deland, Fla. 32720

Filed Aug. 8, 1977, Ser. No. 822,789
Int. Cl.[2] E02B *13/00*
U.S. Cl. 405—43 **4 Claims**



1. A modular drain field section comprising in combination: an elongated molded polymer upper casing formed in one

piece and having a center pipe portion and a pair of troughs, one on each side thereof;

an elongated molded polymer lower casing formed in one piece having a center pipe portion and a pair of troughs, one on each side thereof, each side trough having a plurality of openings therein and said central pipe portion having a plurality of spillways formed therein connecting said pipe portion to each trough;

said upper and lower casings being adhesively connected together to form a central pipe with enclosed drain cavities on either side thereof;

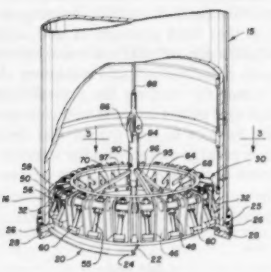
connecting means located on each end of said central pipe, said connecting means having an annular rim formed on the end of each central pipe portion of said modular drain field section for attaching sections of polymer pipe thereto, said modular drain field section connected upper and lower casings forming a central pipe circular in cross-section having spillway openings therein opening into enlarged cavities on either side forming a pontoon configuration, whereby a plurality of modular drain fields can have their central pipe connected together for liquid to flow through into said drainage cavity to form a drain field.

4,145,158

DIAPHRAGM CLOSURE SUPPORT SYSTEM

Fred G. Britton, Bedford; Murl R. Richardson, Fort Worth, and Robert J. von Bose, Arlington, all of Tex., assignors to Oil States Rubber Co., Arlington, Tex.

Filed May 1, 1978, Ser. No. 901,457
Int. Cl.[2] E02D *5/52*
U.S. Cl. 405—208 **8 Claims**



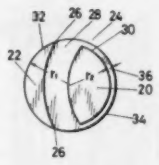
1. An offshore drilling platform support structure having a plurality of hollow tubular piling guides secured thereto and a diaphragm closing opposite ends of said piling guides to control flow of water into the piling guides, the improvement comprising: retainer means secured to the inner wall of the piling guide; a diaphragm support plate positionable to engage the diaphragm; connector means moveably secured to said diaphragm support plate, said connector means being moveable between an extended position engaging said retainer means and a retracted position spaced from said retainer means; and retraction means moveably secured to said diaphragm support plate, said retraction means being arranged to move said connector means from said extended position to said retracted position to permit removal of said diaphragm support plate from engagement with the diaphragm.

4,145,159

BIT FOR ELECTRIC DRILLS

Akio Yamada, 356, Kasagi-cho, Ogaki City, Gifu-ken, and Shohachi Shimizu, 1810-9, 8-chome, Hayashimachi, Ogaki City, Gifu-ken, both of Japan

Filed Apr. 4, 1978, Ser. No. 893,301
Claims priority, application Japan, Apr. 4, 1977, 52/38331; Jul. 1, 1977, 52/87852[U]
Int. Cl.[2] B26D *1/12*; B27G *13/00*
U.S. Cl. 407—53 **6 Claims**



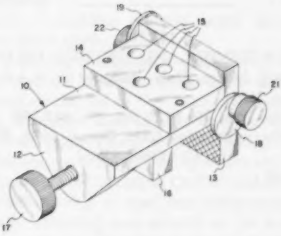
1. A bit wherein a cutting blade without a relief and a center-swing preventing post of a small diameter which is reduced by an equivalent amount to a cutting-in amount are disposed concentrically and oppositely each other at a specified gap on a shank.

4,145,160

DOWELING JIG

Garfield Wiggins, 162 Burnett Ave., Maplewood, N.J. 07040

Filed Nov. 11, 1977, Ser. No. 850,582
Int. Cl.[2] B23B *47/28*
U.S. Cl. 408—103 **10 Claims**



1. In a dowel jig for use in drilling matching holes in two separate pieces of stock, the combination of a horizontally elongated channel having a flat top and two parallel side members, said top member having an undersurface parallel with its upper surface and having a longitudinally spaced series of vertical guide bushings through which a drill bit can pass for making spaced holes in the piece of stock held in contact with said undersurface, one of said side members having attached means for clamping the piece of stock longitudinally against the other side member and said undersurface in a position for drilling operation thereon, an eccentric stop disk at each end of said channel to form a trihedral angle and constituting a stop against which the end or the edge of the stock is positioned thereto, each of said stops being pivotal to move out of such stop position.

4,145,161

SPEED CONTROL

David R. Skinner, Odessa, Tex., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 10, 1977, Ser. No. 823,292
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—22 **5 Claims**

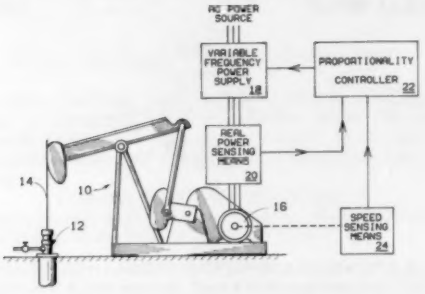
1. A variable pumping speed control system for a beam

pumping unit in which a down-hole pump is actuated by a rod string driven by an AC motor, said system comprising:

(a) means for generating a signal indicative of real power supplied to the pump;

(b) means for generating a signal which is a function of pumping speed;

(c) a variable frequency power supply having a signal input, a power input and a power output, said power input being



connectable to a source of AC power, and said power output adapted to be connected to said AC motor; and

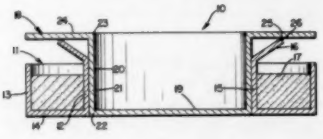
(d) control circuitry having inputs adapted to receive said real power signal and said speed signal and an output connected to said signal input of said variable frequency power supply, said control circuitry being adapted to vary the output of said variable frequency power supply to maintain said speed signal essentially directly proportional to said real power signal.

4,145,162

GETTER DEVICE AND METHOD OF USE

Antonio Schiabel, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Nov. 30, 1977, Ser. No. 855,950
Claims priority, application Italy, Dec. 6, 1976, 30156 A/76
Int. Cl.[2] F04B *37/02*
U.S. Cl. 417—48 **2 Claims**



1. A getter device comprising:

a. a first element in the form of a U shaped ring channel comprising an inner wall, an outer wall, and a bottom wall joining said inner wall to said outer wall, said inner wall comprising a first wall portion substantially parallel to and of substantially the same height as said outer wall and a second wall portion extending upwardly and outwardly to a distance not exceeding the radius of said outer wall and

b. an evaporable getter metal vapour releasing material supported by said first element and

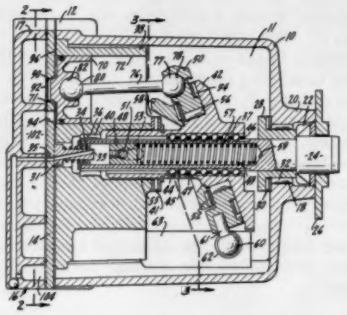
c. a second element comprising a base disc substantially parallel to said bottom wall of said first element and a cylindrical portion attached at one end to the outer periphery of said base disc and in thermal contact with said first portion of said inner wall and the other end of said cylindrical portion supporting an annular disc outwardly extending to a distance substantially equal to the radius of said outer wall said annular disc also being in at least line contact with said second portion of said inner wall.

4,145,163

VARIABLE CAPACITY WOBBLE PLATE COMPRESSOR

Mark J. Fogelberg, Muncie, Ind., and Richard W. Roberts, Lombard, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 12, 1977, Ser. No. 832,054
Int. Cl.[2] F04B *1/26*
U.S. Cl. 417—222 **3 Claims**



1. A compressor comprising: means defining a plurality of gas working spaces each having a piston cooperating with suction and discharge ports to compress a gaseous fluid therein; a drive shaft; a cam mechanism driven by said drive shaft; said cam mechanism having a fixed angular position with respect to said drive shaft axis; a swash plate mounted on said mechanism; means for anchoring said swash plate to prevent rotational movement thereof but permitting freedom for limited rotation about two perpendicular axes such that the rotation of the swash plate imparts a nutating motion to said swash plate about the drive shaft axis; means for connecting said pistons to said swash plate; means for mounting said cam mechanism and said swash plate on said drive shaft so that said cam mechanism and said swash plate are moveable axially from a first position wherein said pistons have minimum clearance volume and a second position wherein said pistons have maximum clearance volume; a fluid tight housing enclosing said swash plate such that fluid pressure in said housing may be applied to the underside of said pistons to produce a force urging said swash plate toward said minimum clearance volume position; means for varying the pressure applied to the underside of each said piston to cause said cam mechanism and said swash plate to float to and fro on said drive shaft, said means including a passage connecting the interior of said housing, i.e. the closed crankcase, to a source of gas at discharge pressure; and means for controlling said pressure in response to the capacity requirements of said compressor.

4,145,164

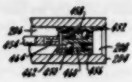
PUMP FOR HYDRAULIC BRAKE ACTUATOR

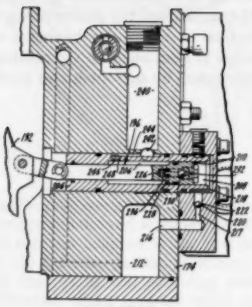
John E. Straut, Mahwah, N.J., assignor to Abex Corporation, New York, N.Y.

Division of Ser. No. 675,820, Apr. 12, 1976, Pat. No. 4,083,436.
This application Sep. 2, 1977, Ser. No. 830,023
Int. Cl.[2] F04B *5/00*
U.S. Cl. 417—252 **3 Claims**

1. In a hydraulic brake actuator, a manual hand pump having a pressure chamber to be pressurized with hydraulic fluid pumped thereto from a reservoir, and equipped with a double acting handle operated pump piston assembly having a rod and a piston head reciprocal in a cylinder to so pressurize a body of fluid by alternately contracting front and rear cylinder chambers located on opposite sides of the head of the piston, when the piston is moved in opposite directions inside the cylinder, the rear cylinder chamber being in communication with said pressure chamber through a check valve and the front cylinder

chamber being in communication with the reservoir through another check valve: a pair of additional check valves and related passages carried by the piston head, one check of said additional valves and its passage allowing flow of pressurized fluid at the front chamber through the head of the piston and





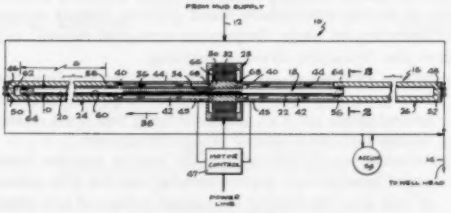
into the rear cylinder chamber on the rod side of the piston, and the other of said additional check valves and its passage allowing flow of pressurized fluid in the rear chamber at the rod side of the piston through the piston head to the front chamber only when the manual force required to operate the piston exceeds a predetermined minimum.

4,145,165

LONG STROKE PUMP

Gerald S. Perkins, and Nicholas R. Moore, both of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 4, 1977, Ser. No. 774,229
Int. Cl.² F04B *17/04*
U.S. Cl. 417—418 **8 Claims**



1. Apparatus for pumping large volumes of oil well drilling mud at very high pressure comprising:

a rod having a pair of ends and a middle portion;

a motor having a stator and a rotor, said middle portion of said rod threadably coupled to said rotor to move the rod axially as the rotor turns;

a pair of cylinders receiving the opposite ends of said rod;

means for energizing said motor to rotate said rotor in alternate directions, to reciprocate said rod over a predetermined stroke length; and

a pair of outlet valves coupled to said cylinders to control the outflow of drilling mud therefrom;

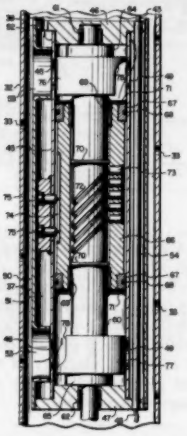
said stroke length being more than five times the diameter of either end of said rod.

4,145,166

DISPLACEMENT PUMP

Orien N. Justice, Dallas, Tex., assignor to Camact Pump Corp., Dallas, Tex.

Filed Dec. 6, 1976, Ser. No. 747,884
Int. Cl.² F04B *39/00*; F16H *37/06*
U.S. Cl. 417—519 **19 Claims**



1. A submersible well pump adapted for use in a well of small bore comprising:

a generally cylindrical electric motor having an axially aligned drive shaft;

a speed reducing transmission mounted on the top end of said motor, said transmission having an input shaft aligned with and connected to the drive shaft of said motor and having an output shaft aligned with said input shaft;

a cam-driven piston pump mounted on the top end of said transmission, said pump having a cam shaft aligned with and connected to the output shaft of said transmission, said cam shaft having at least one unidirectionally inclined generally elliptical cam groove on its surface, a piston having a cam follower therein engaging said cam groove, said piston being mounted for reciprocation on said cam shaft, sealing means between said cam shaft and said piston between the ends of said piston and said cam groove for establishing a sealed lubrication zone surrounding said cam groove, rotary valves mounted on said camshaft above and below said piston, a cylinder enclosing said piston, valves, and shaft;

and an electrical power supply cable connected to said motor at the top end thereof and passing upwardly through said transmission and past said cylinder.

4,145,167

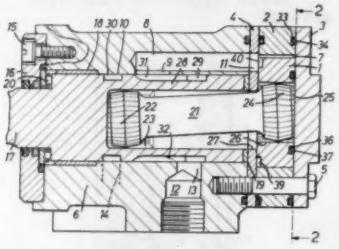
GEROTOR MACHINE WITH PRESSURE BALANCING RECESSES IN INNER GEAR

Johannes V. Baatrup, Sonderborg, Denmark, assignor to Danfoss A/S, Denmark

Continuation of Ser. No. 767,058, Feb. 9, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 884,175
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606172
Int. Cl.² F03C *3/00*; F04C *1/02, 15/00*
U.S. Cl. 418—61 B **1 Claim**

1. A rotary piston machine comprising, a casing, radially inner and outer relatively rotatable and orbitable wheel and ring gears which form compression chambers therebetween,

said ring gear being in fixed relation to said casing, said wheel gear having inner and outer parallel surfaces, said casing forming inner and outer axially spaced sidewalls for said gears with said inner sidewall having a central aperture, a pivot shaft extending through said aperture and engaging said wheel gear, said wheel gear and said casing outer sidewall having mutually engaging surfaces, an annular groove formed in said wheel gear outer surface, a sealing ring in said outer groove forming



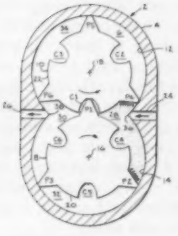
a primary pressure area between said casing outer sidewall and the portion of said wheel gear radially outward from said sealing ring, said wheel gear having teeth with the crest of each tooth having a pair of pressure balancing recesses in said wheel gear inner surface with a symmetrically arranged radially extending rib dividing each pair of recesses, said recesses being dimensioned to form a plurality of secondary pressure areas on said wheel gear to collectively offset the opposite effects of said primary pressure area.

4,145,168

FLUID FLOW ROTATING MACHINERY OF LOBE TYPE

Roy H. Smith, Jr., Houston, Tex., and Bobby J. Travis, 345 Mayhaw St., Vidor, Tex. 77662, assignors to Bobby J. Travis, Vidor, Tex.

Filed Nov. 12, 1976, Ser. No. 741,505
Int. Cl.[2] F01C *1/08, 1/18, 21/00*
U.S. Cl. 418—150 **11 Claims**



1. A fluid flow rotating machine of the lobe type comprising first and second intermeshing rotors having pitch surfaces in sealing tangential contact, said rotors being disposed on parallel axes of rotation and rotating with a common pitch surface speed,

at least the first of said rotors having a generally chisel shaped lobe projecting radially outwardly from its pitch surface to terminate in a tip rounded with an arc centered on the center of said first rotor and with a radius equal to the sum of the radius of the pitch surface and the radial height of the lobe, said lobe tip having opposed leading and trailing corners, such lobe being symmetrical and having a cross-sectional base width greater than the width of said tip and not greater than approximately said height,

at least said second rotor having a lobe receiving peripheral sealing cavity extending inwardly from said pitch surface making sealing and moving contact with said lobe tip, said cavity having a cylindrical bottom surface coaxial with its pitch surface, a radius equal to the difference between the radius of said second rotor and the height of said lobe, and an arc length equal to that of said lobe tip, the ends of said bottom surface of the cavity being joined to leading and trailing surfaces extending outwardly to said pitch surface and having profiles defined by the leading and trailing corners of said lobe tip as the rotor with the lobe is rolled around the rotor with the cavity without slipping,

said lobe having a pair of opposed flanks extending between the leading and trailing corners of the tip and the pitch surface from which the lobe extends, said flanks being spaced from all surfaces of said cavity at all times, so that the only contacts between rotors when said pitch surfaces are not rolling over one another is between the tip of a lobe and the surfaces of the intermeshing cavity,

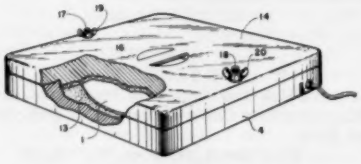
said pitch surface of each rotor having a net undisturbed circumference at least equal to the portion of its circumference interrupted by said lobes and cavities.

4,145,169

RECORD DISC DEWARPING DEVICE

William H. Shows, Box 646, Laurel, Miss. 39440

Filed Apr. 28, 1978, Ser. No. 900,985
Int. Cl.[2] B29C *15/00*
U.S. Cl. 425—11 **1 Claim**



1. A record disc dewarping device for a record disc having a pair of spaced opposite normally planar normally parallel surfaces having substantially spiral grooves formed therein corresponding to audio frequencies recorded therein, said record disc dewarping device comprising

a bottom member of substantially block-like configuration having an aluminum plate with spaced parallel first and second planar surfaces, said plate being supported on said bottom member in spaced relation therewith;

an electric heating element on the bottom member interposed between said bottom member and the first surface of said plate for heating the second surface of said plate;

a first layer of foam rubber on the second surface of said plate;

a top member of substantially block-like configuration having a planar surface;

a second layer of foam rubber on the planar surface of the top member; and

clamping means for releasably clamping the bottom and top members to each other with the first and second layers of foam rubber in juxtaposition whereby when a record disc is positioned and pressed between said layers of foam rubber and the heating element is energized for a predetermined period of time the record disc is dewarped upon cooling.

4,145,170
APPARATUS FOR PRODUCING SHEETS OF THERMOPLASTIC MATERIAL

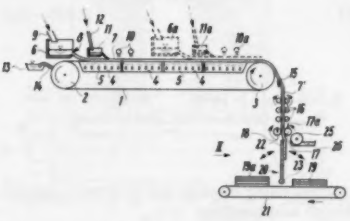
Konrad Schermutzki, Remseck Am Neckar, and Erhard Braun, Murr, both of Fed. Rep. of Germany, assignors to Sandvik Conveyor GmbH, Fellbach, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 849,883

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1976, 2653266

Int. Cl.[2] B29D *7/02*

U.S. Cl. 425—101 **8 Claims**



1. In apparatus for producing rectangular sheets of a product from a liquid, the combination of, a conveyor having a substantially horizontal top run adapted to carry a product from a receiving station to a discharge station, means to deposit the product on said top run at said receiving station, means to effect the solidification of the product while on said top run whereby a continuous web of the product is formed, means to guide said web substantially downwardly from said discharge station, means to sever said web into predetermined lengths to form sheets whereby the sheets are free from the web and are positioned vertically in a vertical zone, and means which move along a path which is substantially horizontal within said zone and which presents a product-receiving structure which is parallel to and moves against one side face of each of said sheets within said zone, including means to move the sheet along a predetermined path transversly with respect to the side faces of the sheet to a stacking position wherein its side faces are substantially horizontal.

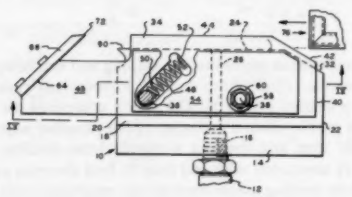
4,145,171
APPARATUS FOR SEALING MULTI-PANE WINDOW UNITS

Raymond J. Guzowski, Milford, Mich., assignor to Pyles Industries, Inc., Wixom, Mich.

Filed Feb. 27, 1978, Ser. No. 881,378

Int. Cl.[2] B29C *6/00*

U.S. Cl. 425—110 **6 Claims**



1. A nozzle for sealing multi-pane window units with a flowable hardenable sealant comprising, in combination, a flat nozzle plate having planar sides and an outer edge, a sealant passage defined in said plate having an inlet and an outlet defined at said outer edge, sealant supply means communicating with said passage inlet, a sealant containment plate mounted upon each planar side of said nozzle plate each having a linear pane engagable edge disposed adjacent said passage outlet, mounting means mounting said containment plates upon said nozzle plate for slidable movement thereon whereby said linear edges are movable with respect to each other and said nozzle plate outer edge, said mounting means including springs biasing said containment plates in a direction transverse to said linear edges and outer edge, and a sealant scraper blade mounted upon each containment plate having a first edge in alignment with and behind said linear edge of the associated containment plate, said containment plates being spaced apart a distance substantially corresponding to the spacing between glass panes to be assembled whereby the edge of a pane of a window unit being assembled engages a containment plate linear edge in a parallel manner positioning the engaged containment plate relative to said nozzle plate and said scraper blades remove sealant from the window unit upon movement of the unit toward said blades in a direction parallel to said linear edges.

4,145,172
PLANT FOR TRANSFORMING SYNTHETIC THERMOPLASTIC WASTE INTO AN AGGLOMERATE

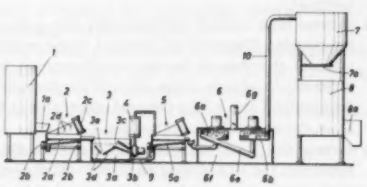
Helmuth Bacher, Linz, Austria, assignor to Krauss-Maffei Austria Ges.m.b.H., Asten, Austria

Filed Nov. 17, 1977, Ser. No. 852,282

Claims priority, application Austria, Nov. 25, 1976, 8756/76

Int. Cl.[2] B29B *1/02*

U.S. Cl. 425—222 **8 Claims**



1. A plant for transforming synthetic thermoplastic waste into an agglomerate, comprising

washing and disintegrating means for washing and disintegrating said waste and for continuously delivering the resulting washed and disintegrated material,

a first conveyor for receiving said washed and disintegrated material from said washing and disintegrating means and for removing water from said material,

a dirt separator for receiving said washed and disintegrated material from said first conveyor and for removing dirt from said washed and disintegrated material and for delivering the resulting cleaned material,

a second conveyor for receiving said cleaned material from said dirt separator and for removing water from said cleaned material,

a water collector for receiving water removed by said second conveyor,

a return conduit for delivering water from said water collector to said dirt separator,

continuously operable drying means for receiving said cleaned material from said second conveyor and for drying said cleaned material and for continuously delivering the resulting dried material,

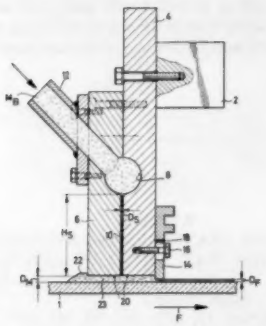
a buffer for receiving said dried material from said drying means and for intermittently delivering said dried material, and

intermittently operable agglomerating means for receiving said intermittently delivered dried material from said buffer and for transforming said dried material into an agglomerate.

4,145,173
FILM-FORMING HEAD

Rudolf Pelzer, Herzogenrath, and Heinz Scholl, Eschweiler, both of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Mar. 31, 1977, Ser. No. 783,343
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1976, 2614560
Int. Cl.[2] B29D 7/02
U.S. Cl. 425—224 9 Claims



1. Apparatus for forming films on a substrate from a flowable film-forming material comprising

an elongate closed channel for receiving the film-forming material,

a channel inlet located longitudinally along the channel for introducing film-forming material under pressure into the channel, the channel having a configuration such that the cross-sectional area of the channel, in planes normal to the longitudinal axis of the channel, decreases as the distance from the channel inlet increases,

a narrow slot for feeding material from the channel to the substrate, the slot having an inlet in fluid communication with the channel and an outlet adapted to be spaced from the substrate,

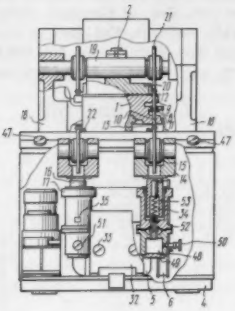
a forming member for forming the material fed onto the substrate by the slot into a film, the forming member being spaced from the outlet of the slot.

4,145,174
ROTARY TABLETTING MACHINE

Emmanuil I. Goloskov; Isaak M. Kott; Genrikh A. Maevsky; Mikhail P. Pinchuk; Anatoly P. Pljuschev, and Vladimir I. Terlo, all of Leningrad, U.S.S.R., assignors to Leningradskoe spelsialnoe konstruktorskoe bjuro polimernogo masinostroenia, U.S.S.R.

Filed Feb. 15, 1978, Ser. No. 877,945
Int. Cl.[2] B30B 11/08
U.S. Cl. 425—78 1 Claim

1. In a rotary tabletting machine comprising a rotor, press tools arranged around the periphery of said rotor, pressure rolls disposed on both sides of said rotor, a means for batching tablet material, a means for controlling said means for batching tablet material, and a hydraulic stabilizer of compressive pressure, an improvement consisting in that said hydraulic stabilizer of compressive pressure incorporates a hydraulic regulator of compressive pressure connected with said controlling means and including a check valve, a hydraulic damper, and a capillary, an inlet of said check valve being connected to said hydraulic stabilizer, and an outlet being connected to said

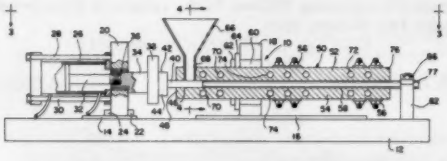


means for controlling through said hydraulic damper and to a drain through said capillary.

4,145,175
EXTRUSION APPARATUS

James Groff, and Stanley Driscoll, both of York, Pa., assignors to Keltrol Enterprises, Inc., York, Pa.

Filed Mar. 8, 1976, Ser. No. 665,000
Int. Cl.[2] B29F 3/08
U.S. Cl. 425—377 34 Claims



1. In an extrusion apparatus for shaping and extruding ultra-high molecular weight high density polyethylene resin particles into a shaped plastic profile which comprises die means defining a profile zone, a precompression chamber adjacent to the profile zone and defining a shaped bore, feeding means operatively associated with said bore to feed the resin particles into the bore heating means operatively associated with the die means to heat portions of the die means, cooling means associated with the die adapted to cooling portions of the die means, and a ram which acts as a punch unit reciprocated relative to the chamber, the improvement which comprises the bore of the precompression chamber, which chamber is of one piece construction with the die and which bore has a cross sectional area of which is substantially equal to the cross sectional area of the profile zone of the die, and in which bore the resin particles are cold-shaped into the shaped profile, the precompression chamber and the profile zone of the die being without any transitional zone therebetween.

4,145,176

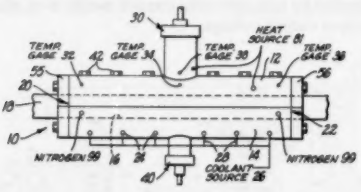
CABLE MOLDING APPARATUS FOR ACCOMPLISHING SAME

Arthur L. Nelson, La Jolla, Calif., assignor to Townsend & Townsend, San Francisco, Calif.

Division of Ser. No. 541,298, Jan. 15, 1975, Pat. No. 4,091,062, which is a continuation-in-part of Ser. No. 388,263, Aug. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 274,823, Jul. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 119,150, Feb. 26, 1971, abandoned. This application Dec. 22, 1977, Ser. No. 863,257

Int. Cl.[2] B29C 6/00

U.S. Cl. 425—405 R 18 Claims



1. Apparatus for molding insulation about a high voltage cable section including a conductive core comprising: a first and second cooperating mold halves defining therebetween a cavity and generally cylindrical mold ends communicating the cavity with the exterior; means for heating the mold halves to a sufficient temperature to fluidize insulating material placed within the cavity; means for introducing into the cavity a pressurized gas; and means for subjecting cable portions extending beyond and being contiguous with the mold ends to a superatmospheric pressurized fluid medium to inhibit the flow of insulating material in a direction outwardly of the mold ends.

4,145,177

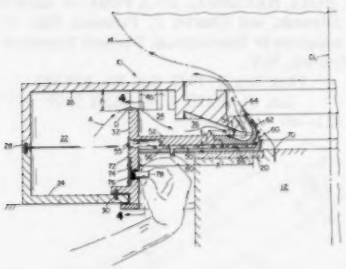
AIR COOLING RING FOR PLASTIC FILM WITH INDEPENDENT LUBRICATING AIR FOR FILM GUIDE SURFACE

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Dec. 12, 1977, Ser. No. 859,824

Int. Cl.[2] B29D 7/22, 23/04

U.S. Cl. 425—445 11 Claims



11. In an air ring for cooling a hot extruding tube of plastic film, including a plenum supplied with cooling air, means defining a cooling air flow path receiving air from the plenum and progressing to an annular cooling orifice that discharges cooling air into contact with the plastic film, means defining a film guide surface upstream along the film path preceding said orifice, and means for supplying air to move with the film between the film and the guide surface,

that improvement comprising a lubricating air bleed port means communicating with air from said plenum independent of said cooling air flow path, said bleed port means communicating with a bleeded air passage extending from said bleed port means to an annular lubricating air outlet positioned in advance of said guide surface.

4,145,178

METHOD AND APPARATUS FOR DECREASING NITROGEN OXIDES AND UNBURNT HYDROCARBONS WHEN BURNING HYDROCARBON FUELS

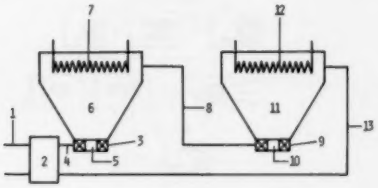
Rolf A. Egnell, Genarp, and Mats I. Moritz, Trelleborg, both of Sweden, assignors to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Jun. 6, 1977, Ser. No. 803,723

Claims priority, application United Kingdom, Jun. 24, 1976, 26230/76

Int. Cl.[2] F23D 11/44

U.S. Cl. 431—11 8 Claims



1. A method of burning fuel containing hydrocarbon compounds, comprising the following steps:

(a) providing at least a first and a second combustion chamber, a heat-exchanger, and atmospheric air for passage into at least one of the combustion chambers,

(b) burning a first proportion of fuel in the first combustion chamber with a substantial excess of atmospheric air to produce first combustion gases containing oxygen,

(c) cooling said first combustion gases,

(d) burning a second portion of fuel in the second combustion chamber using the cooled first combustion gases as the primary oxidizing medium, said first proportion and said second proportion of the fuel being substantially equal to one another, and

(e) using the exhaust gases from the last combustion chamber in the heat-exchanger to preheat at least a portion of the atmospheric air for passage into at least one of the combustion chambers.

4,145,179

COMBUSTION CONTROL SYSTEM

Toshio Tanaka, Toride; Sumio Nakagawa, Tokyo; Motosi Miyanaka, Yanai, and Seiichi Tachi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 25, 1977, Ser. No. 854,641

Claims priority, application Japan, Nov. 29, 1976, 51-142301

Int. Cl.[2] F23N 5/00, 5/26

U.S. Cl. 431—29 5 Claims

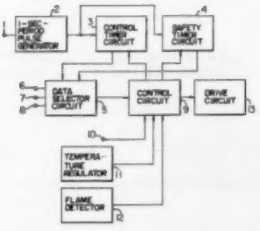
1. A combustion control system comprising:

external load drive circuit means including at least a first drive circuit adapted to actuate external pre-purging means for a first predetermined period of time thereby effecting pre-purge of remaining gases prior to the starting of combustion, a second drive circuit adapted to actuate external fuel supply means thereby effecting fuel supply operation, a third drive circuit adapted to actuate external ignition means for a second predetermined period of time thereby effecting ignition of the supplied fuel at a given time, and a fourth drive circuit adapted to actuate external alarm means which acts to generate an alarm signal in the event of failure of successful ignition of fuel within a third

predetermined period of time after the effort to ignite the fuel by said ignition means and acts also to interrupt the operation of all the external combustion control means including said pre-purging means, said fuel supply means and said ignition means;

first and second timer circuit means each constituted by a plurality of series-connected frequency-dividing flip-flops counting the number of basic clock pulses applied thereto;

first logic circuit means operating in response to the application of the output signals of said first and second timer circuit means and a plurality of selector switching signals to selectively determine the respective values of said first, second and third predetermined periods of time and the sequential order of the steps of said pre-purge, fuel supply and said ignition in the combustion cycle depending on the application mode of said selector switching signals; and



second logic circuit means operating in response to the application of the output signal of said first logic circuit means and external input signals including at least a start signal instructing the commencement of the combustion control and a flame detection signal representing the detected existence of flame to generate a first output signal actuating said first drive circuit thereby actuating said pre-purging means at a selected time, a second output signal actuating said second drive circuit thereby actuating said fuel supply means at another selected time, a third output signal actuating said third drive circuit thereby actuating said ignition means at still another selected time, and a fourth output signal actuating said fourth drive circuit thereby actuating said alarm means when said flame detection signal fails to appear within said third predetermined period of time after the application of said third output signal to said third drive circuit.

4,145,180

IGNITION SYSTEM FOR FUEL BURNING APPARATUS

Dwaine L. Bendorf, Roswell, N. Mex., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Nov. 29, 1977, Ser. No. 855,577
Int. Cl.[2] F23Q *9/14*
U.S. Cl. 431—46 **9 Claims**

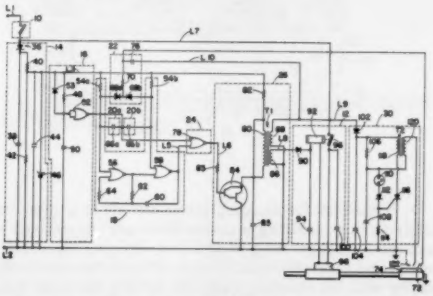
1. A fuel ignition system for fuel burning apparatus having a fuel burner, fuel control means operative when electrically energized to supply fuel to the fuel burner, ignition electrode means for igniting fuel flowing from the fuel burner, flame sensor means including flame electrode means providing an air gap arranged to be bridged by a flame emitted from the fuel burner for conducting flame rectified current when a flame is present at the fuel burner, and operating control means for supplying electrical energy to the fuel ignition system upon a need for operation of the fuel burning apparatus; said fuel ignition system comprising:

an astable oscillator having an output and providing low frequency output pulses at said output, said oscillator including at least one logic gate which has a high impedance inhibit input and which is effective to cause oscillating operation of the oscillator to stop when said inhibit input is energized by a voltage in excess of a predetermined value;

a timing circuit including capacitance means connected across the inhibit input of said logic gate and operable to charge said capacitance means to a voltage exceeding said predetermined value after a predetermined time interval;

switching means responsive to the output pulses of said oscillator to effect energization of said fuel valve means;

voltage converter means operable in response to the output pulses of said oscillator for converting electrical energy supplied by said operating control means to an alternating current output voltage;



spark generating means energized by the alternating current output voltage of said voltage converter means to supply ignition sparks to said ignition electrode means for igniting fuel supplied to said burner to establish a flame;

circuit means for applying the alternating current output voltage of said voltage converter means to said flame sensor means to establish the conduction of flame rectified current through flame bridging said air gap when flame is emitted from said burner;

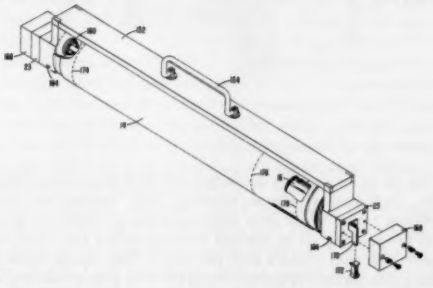
and a current bypass circuit for connecting said flame electrode means across said capacitance means and operable upon the conduction of flame rectified current through flame bridging said air gap to preclude charging of said capacitance means to a voltage exceeding said predetermined value.

4,145,181

APPARATUS TO FACILITATE JAM RECOVERY AND HOT ROLL REVERSAL IN A FUSING ASSEMBLY

Earl G. Edwards, and Charles E. Peterson, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,762
Int. Cl.[2] F27B *9/28*; B65H *5/02*
U.S. Cl. 432—60 **5 Claims**



1. In a hot roll fuser having a hot roll and a backup roll operable to form a fusing nip, the combination comprising:

main frame means having slidable coupling means to receive and releasably hold said hot roll;

sheet path control means cooperating with a sheet as it emerges from said fusing nip, and operable to guide the sheet away from the nip; and

first link means pivotally mounted on said main frame and mounting said sheet path control means;

said first link means being movable from a first position whereat it locks said hot roll in said main frame member, and supports said sheet path control means at said nip, to a second position whereat said hot roll is unlocked for manual removal, and said sheet path control means is moved away from said fusing nip to facilitate manual jam clearance.

4,145,182

PROCESS FOR THE PREPARATION OF DISPERSE DYES HAVING GOOD PRINTING PROPERTIES FOR TRANSFER PRINTING

Konrad Opitz, Liederbach, Taunus, and Christa Uhde, Kelkheim, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

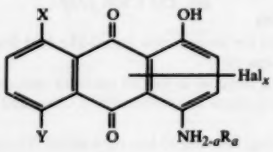
Continuation of Ser. No. 551,234, Feb. 20, 1975. This application Feb. 2, 1978, Ser. No. 874,613

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1974, 2408899

Int. Cl.[2] C09B *1/00, 5/62*

U.S. Cl. 8—39 R 10 Claims

1. A process for finishing disperse dyestuffs of the formula



wherein one of the substituents X and Y is hydroxy and the other is $-NH_{2-b}R'_b$, R and R′ are the same or different groups selected from methyl and ethyl, a and b are numbers from zero to 2, the sum of which is zero to 3, Hal is chlorine or bromine and x is a number from zero to 2, said dyestuff being one which is sufficiently capable of subliming so as to be used in a transfer print process, said finishing process being for the purpose of improving the performance of the dyestuff in a printing ink of constant viscosity used in an anhydrous process for printing transfer printing paper, which finishing process comprises treating said dyestuff at a temperature of 80° to 130° C. in a liquid medium consisting of water.

4,145,183

METHOD FOR THE OXIDATIVE TREATMENT OF TEXTILES WITH ACTIVATED PEROXYGEN COMPOUNDS

Joseph H. Bostwick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 642,235, Dec. 19, 1975, abandoned. This application Nov. 11, 1977, Ser. No. 850,671

Int. Cl.[2] D06L *3/02*

U.S. Cl. 8—111 11 Claims

1. A method for treating the surface of a textile fabric oxidatively using activated peroxygen compounds comprising

(1) coating at least one stained area on the surface with an adherent layer of a viscous water-soluble composition comprising

(a) a peroxide activator dispersed in

(b) a nonionic surfactant having an HLB number below about 30, the weight ratio of activator to surfactant in the composition being from about 1:10 to about 10:1; and

(2) immersing the coated fabric in water containing at least 5 ppm by weight, basis active oxygen, of peroxygen compound until the layer of viscous composition has disintegrated.

8. A viscous anhydrous water-soluble composition for preparing the surface of a textile fabric for oxidative treatment with activated peroxygen compound dispersed in water comprising

(a) a peroxide activator dispersed in

(b) a nonionic, water-soluble surfactant having an HLB number below about 30, the weight ratio of activator to surfactant in the composition being from about 1:10 to about 10:1.

4,145,184

DETERGENT COMPOSITION CONTAINING ENCAPSULATED PERFUME

Devin K. Brain, and Marian T. Cummins, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 28, 1975, Ser. No. 636,381

Int. Cl.[2] B08B *3/04, 3/10*

U.S. Cl. 8—137 19 Claims

1. A laundry detergent composition comprising: A laundry detergent composition comprising:

(a) from 2% to 95% of a surfactant selected from the group consisting of anionic, nonionic, ampholytic and zwitterionic surfactants, and mixtures thereof; and

(b) an effective amount of a perfuming agent comprising a perfume encapsulated in water insoluble, friable microcapsules having an average size of from about 5 to about 300 microns

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4,145,185

REAGENTS FOR SCREENING TESTS AND BIOASSAY OF VON WILLEBRAND'S FACTOR (PLATELET AGGREGATING FACTOR) IN BLOOD PLASMAS

Kenneth M. Brinkhous, Chapel Hill, and Marjorie S. Read, Durham, both of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Filed Feb. 25, 1977, Ser. No. 772,228

Int. Cl.[2] G01N *33/16;* C09K *3/00;* A61K *35/38*

U.S. Cl. 23—230 B 15 Claims

1. A test reagent for the bioassay of von Willebrand's factor and platelet aggregating factor in blood plasmas comprising blood platelets and a snake venom characterized as having a positive cofactor effect for platelet aggregation.

4,145,186

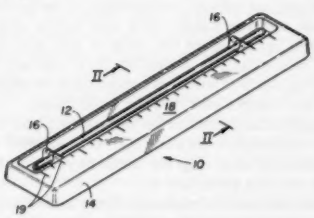
STERILIZATION DETECTION DEVICE AND METHOD

Harold W. Andersen, Oyster Bay, N.Y., assignor to H. W. Andersen Products Inc., Oyster Bay, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,552

Int. Cl.[2] G01N *31/22;* G01K *11/12*

U.S. Cl. 23—232 R 16 Claims



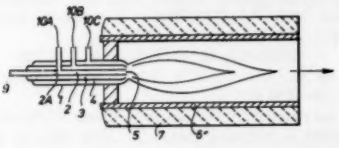
1. A method of measuring the instantaneous degree of effectiveness of a sterilant delivered to an enclosed space comprising the steps of coating a mixture of a salt of a strong acid and a weak base and an acid-alkali indicator dye on particles of an inert carrier, disposing said coated carrier particles within a container element such that interstices are provided between the coated carrier particles, said container element being impermeable to said sterilant, said container having an opening, passing said sterilant directly from said enclosed space through said opening into said container, reacting said sterilant with said mixture to effect a color change relative to the unreacted mixture, advancing said sterilant through the interstices between said coated particles such that the salt in the mixture on the coated particles closer to said opening is exhausted by the sterilant to effect a color change before said sterilant advances to the next adjacent particles further removed from said container opening, said color change between said reacted and unreacted mixture being defined by a discernible line of demar-

kation, and progressively advancing said line of demarkation away from said opening as the time, temperature and concentration of said sterilant in said enclosed space increases, calibrating said container element by providing calibrated indicia fixedly positioned relative to said container element to provide various and successively progressive indications of the effectiveness of said sterilant, and measuring the instantaneous degree of effectiveness of said sterilant delivered to said enclosed space by the position of said line of demarkation relative to the calibrated indicia.

4,145,187
TREATMENT OF MATERIAL WITH HYDROGEN CHLORIDE

Raymond E. Oliver, Johannesburg, South Africa, and George McGuire, London, England, assignors to Matthey Rustenburg Refiners (Pty.) Ltd., Johannesburg, South Africa

Continuation-in-part of Ser. No. 559,423, Mar. 18, 1975, Pat. No. 3,998,926. This application Dec. 2, 1976, Ser. No. 746,748
Claims priority, application United Kingdom, Mar. 21, 1974, 12598/74
Int. Cl.[2] B01D *47/06*; B01J *8/08*; C01G *55/00*; F27B *15/08*
U.S. Cl. 422—232 **9 Claims**



1. Apparatus for separating base metal and silver from precious metal components in a mineral concentrate containing the same which comprises:

(a) a tubular member made of heat resistant material and forming a reaction zone,

(b) a tubular assembly including at least one tube having an end opening into said reaction zone and means for passing hydrogen and chlorine through said assembly to said end to form a hydrogen-chlorine flame at said end extending into said reaction zone,

(c) a supply of mineral concentrate in particulate form and means communicating with said supply and including a venturi intermediate the ends of said tube for inducting said concentrate in particulate form into said tube and for feeding the thus inducted concentrate through said tube to the end thereof and then into said flame,

(d) heat insulation means for maintaining said reaction zone at a temperature between 900° C. and 2500° C.,

(e) means for removing the resulting reaction mixture from said reaction zone, and

(f) means including a high turbulence zone for scrubbing the thus removed reaction mixture by contact with a high velocity concurrent aqueous scrubbing solution.

4,145,188
LIQUEFACTION OF SOLID ORGANIC WASTES

Wilton F. Espenscheid, Princeton, N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,740
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—50 **8 Claims**

1. A process for liquefaction of solid carbohydrate waste material without the use of high pressures or reducing gases or catalysts which comprises forming a slurry by admixing comminuted carbohydrate waste with a highly aromatic refinery petroleum residuum solvent having a boiling point between about 450° F and 1100° F, wherein said petroleum residuum solvent has a hydrogen content distribution in which the H_{Ar} proton content is between about 30 and 50 percent, the H_{α} proton content is at least 30 percent and the H_{α}/H_{β} proton ratio is above about 1.4, and heating said slurry at a temperature in the range between about 350° F and 850° F for a period of time sufficient to convert the slurry into a homogeneous hydrocarbonaceous composition which has a flowable heavy oil or bitumen consistency at 25° C.

4,145,189
PROCESS FOR PREPARING A CLEAN-BURNING, LOW SULPHUR LIQUID FUEL FROM COAL

Åge Solbakken, Montgomery, Tex., assignor to Energy Conversion Systems Limited, London, United Kingdom

Filed Jun. 13, 1977, Ser. No. 806,135
Claims priority, application United Kingdom, Sep. 8, 1976, 37293/76
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 **10 Claims**

1. A process for preparing a liquid-like fuel from coal, comprising the steps of:

a. subjecting the coal to low or medium temperature pyrolysis, so as to form an oil fraction, a char, and a water fraction,

b. micronizing the char to less than about 200 standard mesh, and

c. forming a stable suspension comprising the liquid-like fuel by blending the oil fraction and the char from step (a) with water wherein (i) the oil fraction is mixed with the water in a ratio of about 3 to about 0.5 parts by weight, respectively, (ii) the micronized char is blended with the water in a ratio of about 5 to about 1.5 parts by weight, respectively, and (iii) the mixtures of steps (i) and (ii) are combined.

4,145,190
CATALYTIC FUEL ADDITIVE FOR JET, GASOLINE, DIESEL, AND BUNKER FUELS

Harry M. Webb, Toronto, Canada, assignor to Natural Resources Guardianship International, Inc., Clayville, N.Y.

Continuation-in-part of Ser. No. 809,864, Jun. 24, 1977, and a continuation-in-part of Ser. No. 783,777, Apr. 1, 1977. This application Oct. 13, 1977, Ser. No. 841,905
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—56 **17 Claims**

1. A fuel additive for internal combustion and diesel engines consisting of an active ingredient formulation comprising a mixture of picric acid and ferrous sulfate in a relationship of picric acid:ferrous sulfate of about 2:1 to about 550:1 in a mixed solvent of lower alcohol, toluene, and water.

4,145,191
GAS STREAM CLEANING SYSTEM AND METHOD

S. Kumar Kunchal, 300 Enterprise Bldg., Grand Junction, Colo. 81501; Louis J. Erck, Anvil Points, and Harry A. Harris, No. 25 Anvil Points, both of Rifle, Colo. 81650

Filed Apr. 13, 1977, Ser. No. 787,299
Int. Cl.[2] B03C *3/01*
U.S. Cl. 55—4 **6 Claims**

1. A process for treating a relatively high temperature gas dispersoid which is the off-gas from retorting particulate oil shale, in which the gas dispersoid contains substantial quantities of a mist of shale oil droplets and dust from the shale comprising:

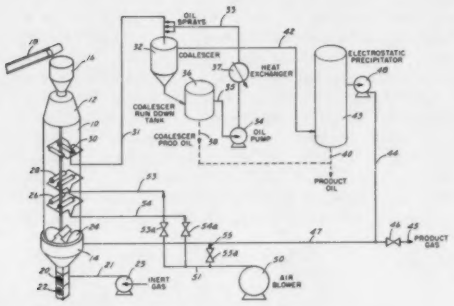
(a) passing such a gas dispersoid containing shale oil mist and dust at a predetermined initial velocity downwardly through spray means of a wash oil at a predetermined temperature to provide a gas dispersoid wash oil mixture;

(b) cooling said wash oil to the predetermined temperature prior to the passing of the gas dispersoid through said spray means;

(c) providing a sufficient volume of the predetermined tem-

perature wash oil to the volume of the gas dispersoid passing through said spray means to reduce and maintain the temperature of the gas dispersoid at about said predetermined temperature of said wash oil;

(d) passing the gas dispersoid wash oil mixture through a stage providing a circuitous route and a flow interruption by changing velocity and directions of the gas dispersoid wash oil mixture to essentially remove the dust and a portion of the shale oil mist and the wash oil from the gas dispersoid wash oil mixture and reduce the shale oil mist content of the gas dispersoid to about half of the original gas dispersoid content;



(e) passing said removed dust and a part of the portion of the shale oil mist and the wash oil to a product oil line;

(f) discharging the resultant gas dispersoid from said stage at a velocity lower than said initial velocity;

(g) passing the lower velocity gas dispersoid through an electrostatic precipitator to essentially remove the remaining oil mist and wash oil from the gas dispersoid producing a clean gas; and,

(h) passing the oil removed from the gas dispersoid in the electrostatic precipitator to the product oil line.

4,145,192

METHOD OF PROCESSING TECHNICAL GASES

Hans Beise, Schieritzstr. 19; Burkhard Schlicht, Lehnestr. 31; Manfred Thiele, Schlossalle 29 a, all of Berlin; Manfred Gross, Strasse d. Einheit 17, Freiberg, Sa; Hans-Peter Minak, Am seilerberg 23, Freiberg, Sa; Manfred Schingnitz, Kornerstr. 19, Freiberg, Sa; Klaus Wehner, Hocker Gasse 1, Leuna, and Werner Burk, Block 247, Haus 10, Halle-Neustadt, all of German Democratic Rep.

Filed Feb. 23, 1977, Ser. No. 771,147

Claims priority, application German Democratic Rep., Feb. 23, 1976, 191435

Int. Cl.[2] B01D *53/02*

U.S. Cl. 55—32 **6 Claims**

1. A method of processing natural or synthetic gases containing water vapor, acidic and neutral sulphur compounds and higher hydrocarbons, which compises treating said gas with an anhydrous solvent containing N-methyl-ε-caprolactam, an alkanolamine and a glycol to simultaneously remove said sulphur compounds; hydrocarbons and water vapor.

4,145,193

APPARATUS FOR CLEANING STACK GAS AND USING SAME FOR GENERATION OF ELECTRIC POWER

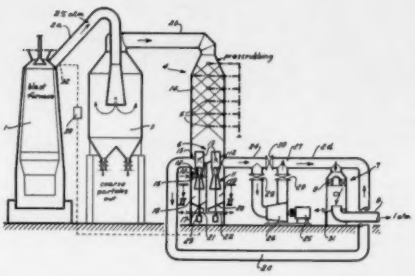
Karl R. Hegemann, Essen-Bergerhausen, Fed. Rep. of Germany, assignor to Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserrückkühlanlagen Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 692,731, Jun. 4, 1976, Pat. No. 4,055,331, and a continuation-in-part of Ser. No. 520,920, Nov. 4, 1974, Pat. No. 4,007,025. This application Jul. 25, 1977, Ser. No. 818,675

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1973, 2355457; Aug. 20, 1974, 2439757; Aug. 20, 1974, 2439758

Int. Cl.[2] B01D *47/10*

U.S. Cl. 55—210 **5 Claims**



1. A gas-cleaning apparatus for a pressure blast furnace having a waste-gas duct connected to said furnace, said apparatus comprising:

a prewasher having a gas inlet and a gas outlet, said inlet of said prewasher being connected to and receiving gas from said duct, said prewasher prescrubbing waste gas from said duct;

an upstream differential-pressure washer connected to said outlet of said prewasher, said upstream differential-pressure washer comprising a tube member, a control member in said tube member defining a variable gap traversed by gas passing through said upstream differential-pressure washer, and comparator means responsive to the pressure differential across said gap and connected to said control member of said upstream differential-pressure washer for controlling the displacement thereof, said upstream differential-pressure washer having an outlet;

a downstream differential-pressure washer connected to the outlet of said upstream differential-pressure washer and comprising a tubular member traversed by gas passing through said downstream differential-pressure washer, a displaceable control member in said tube member of said downstream differential-pressure washer and defining a variable gap therewith traversed by gas, and control means connected to sensor means in said waste gas duct and responsive to the gas pressure in said furnace for shifting said displaceable control member of said downstream differential-pressure washer, said downstream differential-pressure washer having an outlet;

an expansion turbine having a gas inlet connected to the outlet of said upstream differential-pressure washer and an outlet connected to the outlet of said downstream differential-pressure washer;

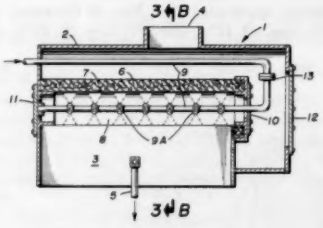
a control valve connected in series with said turbine; and

a droplet separator connected to the outlet of said turbine and the outlet of said downstream differential-pressure washer.

4,145,194
CYLINDRICAL FIBER BED SEPARATOR ELEMENT WITH SIDE-ENTRY INLET DUCT TO CORE OF ELEMENT

Walter R. Horlacher, Jr., Des Peres, and Jack L. Owens, Harvester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 7, 1977, Ser. No. 858,133
Int. Cl.[2] B01D *46/04*; F24C *15/20*
U.S. Cl. 55—242 **10 Claims**



1. A filter bed separator for separation of a liquid from a moving gas stream, said separator comprising a housing having inlet and outlet means for the gas stream and drainage means for the separated liquid phase, and disposed within said housing at least one cylindrical fiber bed element with gas inlet duct means in communication with said inlet means of said housing, and baffle means in conjunction with each of said at least one cylindrical element to cause the gas stream to flow through the filter bed of each of said at least one cylindrical element from the hereinafter defined hollow core thereof radially outwardly; each of said at least one cylindrical element with gas inlet duct means comprising:

(a) a non-matting bed of filter material of thickness defined by an inner and outer circumference, forming a substantially cylindrical filter bed having a hollow core, said filter bed circumferentially terminating at the walls of said gas inlet duct means; and

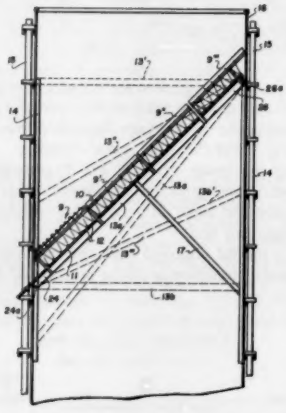
(b) said gas inlet duct means comprising at least one elongated duct disposed along at least a substantial portion of the longitudinal length of the cylindrical element and the walls of which extend from at least said housing inlet means to the inner circumference of the filter bed.

4,145,195
ADJUSTABLE DEVICE FOR REMOVING POLLUTANTS FROM GASES AND VAPORS EVOLVED DURING COKE QUENCHING OPERATIONS

Johannes Knappstein; Josef Stratmann, and Manfred Strobel, all of Recklinghausen, Fed. Rep. of Germany, assignors to Firma Carl Still, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 700,337, Jun. 28, 1976, abandoned, which is a continuation of Ser. No. 557,811, Mar. 28, 1975, abandoned, which is a continuation of Ser. No. 269,723, Jul. 7, 1972, abandoned. This application Apr. 4, 1977, Ser. No. 784,372
Int. Cl.[2] B01D *45/18*
U.S. Cl. 55—242 **1 Claim**

1. A device for removing solid pollutants, such as coke dust, from steam and gases evolved during coke quenching operations, in which the evolved steam and gases enter the bottom end of a discharge stack for discharge, from the upper end thereof, into the atmosphere, said device comprising, in combination, at least one pair of vertically oriented support members arranged in opposition along the inner surface of said stack; at least one support beam pivotally connected, at one end, to one of said support members at a selected one of plural points intermediate the bottom and upper ends of said stack; means supporting the opposite end of said at least one support beam at a selected one of plural points along the opposite support member so that said support beam extends transversely of said stack in the path of steam and gases entering said stack for discharge to atmosphere from the upper end of said stack; plural louvered panels mounted on said support beam in a number sufficient to extend across substantially the entire cross-section of said stack in the path of the steam and gases; each of said louvered panels comprising baffle supports and a plurality of shutter baffles stationarily engaged in said baffle supports and extending transverely of said support beam to define tortuous flow paths to deflect the steam and gases, flowing upwardly through said stack during a coke quenching operation, to remove and retain solid pollutants therefrom; and a liquid flushing system supported from said at least one support beam and including conduit means having liquid spray means, at spaced locations along its length, directed toward said shutter baffles; said flushing system being inactive during a coke quenching operation and activated only between successive coke quenching operations to flush solid pollutants from said shutter baffles; said at least one support beam being angularly adjustable about its pivotal connection to vary the angle at which said support beam extends across said stack, and said at least one support beam being adjustable in length and said louvered panels being adjustable in number so that, in each angular orientation of said at least one support beam, the number of said louvered panels is sufficient to extend substantially completely across said stack, whereby said device is effective



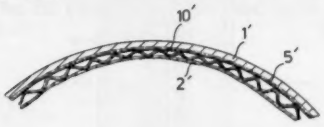
with different flow rates of the steam and gases; said conduit means including several sections interconnected by flexible conduits so as to conform to such different angular orientations of said support beam; said at least one support beam comprising two telescopically interengaged support beam sections, each section having respective louvered panels mounted thereon and variable in number in accordance with the desired length of said support beam; one of said two telescopically interengaged support beam sections being pivotally connected, at one end, to said one of said support members at a selected one of plural points intermediate the bottom and upper ends of said stack; said opposite support member comprising a vertically oriented and elongated guideway; the other of said two telescopically interengaged support beam sections having a roller rotatably mounted on a shaft at the outer end thereof and engaged in side guideway; and hoist means, including a traction element secured to the outer end of said other of said two telescopically interengaged support beam sections, operable to raise and lower the outer end of said other of said two telescopically interengaged support beam sections with said roller running in said guideway so that the outer end of said other of said two telescopically interengaged support beam sections may be selectively raised and lowered with simultaneous extension and retraction of the overall length of said two telescopically interengaged support beam sections.

4,145,196

FILTER ELEMENT

Magnus Alskog, Skara, Sweden, assignor to AB Lectrostatic, Skara, Sweden

Filed Sep. 22, 1977, Ser. No. 835,754
Claims priority, application Sweden, Oct. 8, 1976, 7611182
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—380 3 Claims



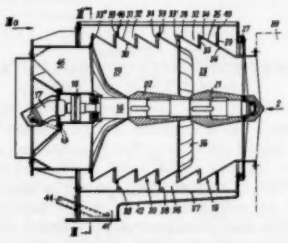
1. In a filter element intended to operate at high, pulsating pressure and including a hose-like filter means made of fibrous material, an inlet to the interior for supplying contaminated air and a wall through which purified air departs, the filter means surrounded by a net-like, elastic hose-like member, the improvement comprising; the length of the filter means and the circumference of said means in the expanded state of said means exceed the length and circumference of the net-like hose-like member, a corrugated wall interposed between said filter member and said hose-like member, the filter means arranged in folds abutting the corrugated wall, said corrugations extending in the longitudinal direction of the filter means, and said filter means held compressed by said hose-like member.

4,145,197

IMPELLER FOR SEPARATING DUST PARTICLES FROM AN AIR STREAM

Emanuel Strahsner, Zeltweg; Peter Kogler, Knittelfeld, and Alfred J. Zitz, Zeltweg, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed May 5, 1977, Ser. No. 794,024
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—401 10 Claims



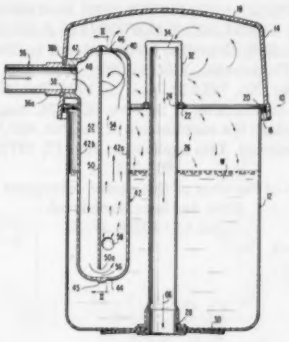
1. A device for separating dust particles from an air stream comprising a centrifugal separator having a rear air outlet end and a forward inlet end for receiving a stream of dust laden air from a blower and means connected in advance of the inlet end of the separator for spraying water into the air stream entering the separator, said separator including a fixed housing and rotatable impeller means within the housing and spaced radially therefrom, said impeller means including a plurality of radial blades having saw-tooth outer edges and a plurality of conical rings arranged in axially spaced relationship with respect to the axis of the impeller means so as to form a plurality of steps, the larger diameter of said rings facing the outlet end of the housing, said rings surrounding said blades and secured along the entire length of the saw-tooth edges thereof so as to form therewith a plurality of radially extending chambers, a plurality of axially-spaced apart annular discs coaxial with the impeller and carried thereby, each of said discs having an outer edge located near the inner surface of a ring in the region of the largest diameter of that ring and forming therewith a gap, each of said discs having an inner edge engaging the outer surface of the next downstream ring in the region of the smallest diameter of that next upstream ring.

4,145,198

SINGLE TUBE HYDRO AIR FILTER WITH DIVIDING WALL

Thomas M. Laule, Sparks, Nev., assignor to Parise & Sons, Inc., Reno, Nev.

Filed Oct. 7, 1977, Ser. No. 840,443
Int. Cl.[2] B01D *45/12*
U.S. Cl. 55—439 10 Claims



1. In a dump bucket for a vacuum cleaner, said dump bucket comprising:

a cylindrical, closed container having a bottom wall, a top wall and a side wall, and acting to accumulate liquid therein and having its axis extending vertically;

an open hollow riser tube extending upwardly from the bottom of the container and being open at the bottom to the container exterior and terminating short of the container top wall;

a hollow fluid return tube projecting through a wall of the container near its top, a hydro air filter mounted to said fluid return tube within said container, extending vertically therein and comprising separate, adjacent parallel vertical first downwardly and second upwardly flow paths, and being in fluid communication with said return tube, said flow paths being in fluid communication with each other at the bottom of said hydro air filter, and at least one aperture within the bottom of said hydro air filter and opening to the interior of said container, and nozle means at the top of said hydro air filter fluid communicating the upper end of the second flow path with the interior of the container, such that liquid within the container at a level above said at least one aperture is aspirated by return fluid entering the inlet tube as the return fluid moves upwardly within the section flow path to cause a mixture of the return fluid and the liquid entering said aperture to be discharged through the nozzle means for impact against the container interior and to separate by entrainment of the liquid components thereof when vacuum pressure is applied to the hollow riser tube at the bottom of the dump bucket container, such that under vacuum pressure, the return fluid causes the liquid within the container to enter the stream of return fluid to effect filtering of the return fluid stream, the improvement wherein said hydro air filter comprises a single closed tube, a vertical divider wall plate is carried internally within said single closed tube and spanning across said tube to separate said single, closed tube into said two vertical flow paths, and means defining an opening within the lower end of said plate to effect fluid communication between said paths at the bottom of said single closed

tube, said fluid return tube connects through a wall of said single tube means to one side of said plate at the top of said single, closed tube, said at least one aperture is provided within the wall of said single, closed tube on the side of said plate defining said second flow path and said nozzle means comprises at least one nozzle mounted to said single closed tube at the upper end thereof and opening into said second flow path.

4,145,199

METHOD AND APPARATUS FOR FORMING KINKY FIBERS FROM HEAT-SOFTENABLE MATERIAL

Robert G. Russell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 745,028, Nov. 26, 1976, Pat. No. 4,050,916, which is a continuation of Ser. No. 608,420, Aug. 28, 1975, abandoned, which is a continuation of Ser. No. 469,729, May 13, 1974, abandoned. This application Jun. 17, 1977, Ser. No. 807,623

The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—2 **13 Claims**

1. The method of forming continuous fibers of heat-softened glass including flowing streams of the glass from a feeder, the regions of the streams adjacent the feeder being cone-shaped, attenuating the streams to continuous fibers, engaging the attenuated continuous fibers with a rotating body, oscillating the attenuated continuous fibers by the rotating body whereby the oscillations effect successive distortions of the tips of the cones of glass, and impinging a stream of liquid against the distortions of the glass streams for reducing the temperature of the glass streams at the distortions at a rate sufficient to form successive permanent bends in the attenuated continuous fibers.

4,145,200

PRODUCTION OF OPTICAL GLASS FIBERS

Tetsuya Yamazaki, Itami, and Ken Koizumi, Kawanishi, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

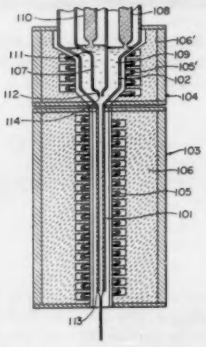
Filed Jan. 24, 1978, Ser. No. 871,985

Claims priority, application Japan, Jan. 27, 1977, 52-8345

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—2 **16 Claims**

1. In a method for producing optical glass fibers which comprises co-spinning glass melts of different kinds through coaxially disposed discharge nozzles of a multi-member crucible composed of two or more crucible members having a discharge nozzle at their bottom, the improvement wherein the outermost nozzle has a length of 30 mm to 2000 mm and is heated so that at least a part of it is maintained at a temperature



equal to, or higher than, the temperature of the crucible thereby to increase the speed of spinning.

4,145,201

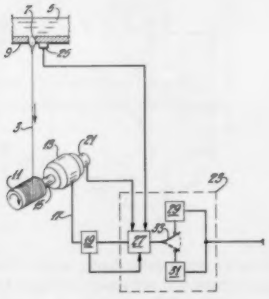
GLASS FIBER PRODUCING AND COLLECTING APPARATUS

John D. Phillips, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 6, 1978, Ser. No. 884,100

Int. Cl.[2] C03G *37/02*

U.S. Cl. 65—2 **11 Claims**

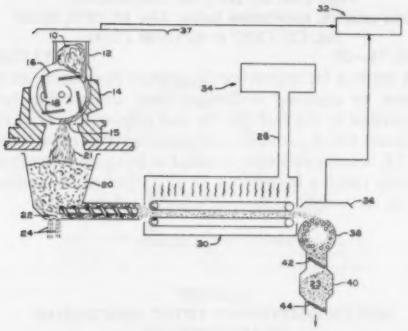


1. A method for producing uniform continuous fibers from a supply of thermoplastic material comprising the steps of feeding a supply of the material through a plurality of orifices to form streams, attenuating said streams to form a plurality of fibers, said step of attenuating including the step of pulling said fibers from said orifices at a first pulling rate, sensing an interruption in said pulling and responsive to said interruption altering the pulling rate for said fibers to a second pulling rate, restarting said step of attenuating said streams to form said fibers and then altering the pulling rate from said second pulling rate to said first pulling rate subsequent to said restart, and wherein said first and second pulling rates are different pulling rates.

4,145,202
METHOD FOR REPROCESSING GLASS FIBERS

Martin A. Grodin, Pittsburgh; Herbert W. Barch, Natrona Heights; Frank E. Harvey, and Patrick C. Chardello, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 783,130, Mar. 31, 1977, abandoned. This application Apr. 26, 1978, Ser. No. 900,391
Int. Cl.[2] C03B *37/00, 25/00;* C03C *25/00*
U.S. Cl. 65—2 13 Claims

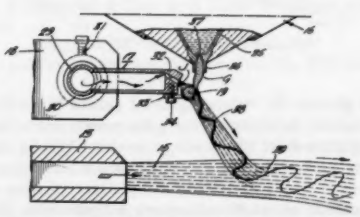


1. A method of treating waste glass filaments and/or strands having organic coatings present thereon comprising heating the glass filaments and/or strands in a controlled thermal environment wherein the filaments and/or strands are heated to a first thermal treatment temperature for a sufficient period of time to remove substantially all the moisture therefrom, raising the temperature of the filaments and/or strands after the moisture has been removed to a second thermal treatment temperature sufficient to volatilize the organic components of coatings present, then raising the temperature of the filaments and/or strands to a final thermal treatment temperature sufficient to incinerate any residual material on the surface thereof while maintaining the filaments and/or strands at temperatures below the softening point thereof and collecting the resulting filaments and/or strands.

4,145,203
APPARATUS FOR FORMING FIBERS FROM ATTENUABLE MATERIAL

Marcel Levecque, Birchrunville, Pa.; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 676,755, Apr. 14, 1976, and a continuation-in-part of Ser. No. 762,789, Jan. 25, 1977, which is a continuation-in-part of Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Sep. 19, 1977, Ser. No. 834,540
Claims priority, application France, Aug. 23, 1977, 77 25690
Int. Cl.[2] C03B *37/04*
U.S. Cl. 65—16 20 Claims

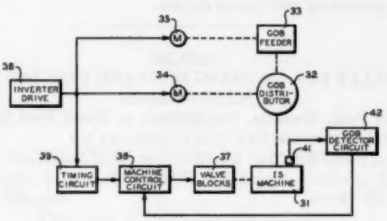


16. Equipment for making fibers from attenuable material comprising supply means for the attenuable material having a series of spaced delivery orifices positioned for downward delivery of streams of the material, means for establishing gaseous jets comprising a series of orifices respectively aligned with individual delivery orifices for the attenuable material, a jet guiding element having a surface in the flow of the jets, the section of said element in a plane parallel to the axes of the jets and streams of material having a portion which is convexly curved and is positioned to intercept the streams of attenuable material.

4,145,204
TIMING PULSE GENERATOR FOR A GLASSWARE FORMING MACHINE

Daniel S. Farkas, and Philip D. Perry, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 1, 1977, Ser. No. 856,387
Int. Cl.[2] C03B *9/40*
U.S. Cl. 65—164 11 Claims

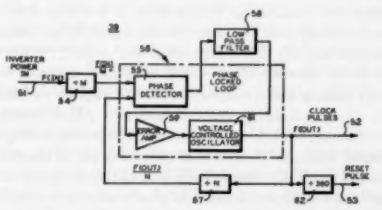


1. An apparatus for forming glassware comprising:
means for forming gobs of molten glass and for distributing said gobs to an individual section glassware forming machine at a predetermined rate;
electric means for generating electric power at a selected frequency;
frequency proportioning means connected to said electric power generating means for generating timing signals at a frequency proportional to said selected frequency;
electric drive means responsive to the electric power for driving said means for forming and distributing gobs at said predetermined rate; and
a control circuit responsive to said timing signals for cyclically controlling each individual section of said individual section machine in a predetermined time sequence of steps for forming glass from said gobs.

4,145,205
TIMING PULSE GENERATOR FOR A GLASSWARE FORMING MACHINE

Daniel S. Farkas, Toledo, Ohio, and Erwin M. Ferenczy, Costa Mesa, Calif., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 15, 1977, Ser. No. 860,934
Int. Cl.[2] C03B *9/40*
U.S. Cl. 65—164 7 Claims



1. In an apparatus for forming glassware having:
means for forming gobs of molten glass and for distributing

said gobs to an individual section glassware forming machine at a predetermined rate;

means for generating electric power at a selected frequency and timing signals at a frequency proportional to said selected frequency;

drive means responsive to the electric power for driving said means for forming and distributing gobs at said predetermined rate; and

a control circuit responsive to said timing signals for cyclically controlling each individual section of said individual section machine in a predetermined timed sequence of steps for forming glassware from said gobs;

said means for generating electric power and timing signals comprising:

means for generating a frequency reference signal having a frequency which determines the selected frequency of said power source;

means responsive to said frequency reference signal for generating said electric power; and

means responsive to said frequency reference signal for generating said timing signals.

4,145,206

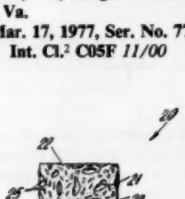
PELLET FOR GROWING SEED AND PROCESS FOR MAKING SAME

Stuart Ford, Manakin, Va., assignor to Stuart Ford Incorporated, Richmond, Va.

Filed Mar. 17, 1977, Ser. No. 778,453

Int. Cl.[2] C05F *11/00*

U.S. Cl. 71—23 **19 Claims**



1. A dried pellet for growing seed consisting of:

a plurality of seeds;

an inorganic fertilizer; and

a growing medium comprising comminuted vegetable matter, whereby the pellet protects the seed while providing a growth system; and wherein said pellet is formed with a plurality of voids, said voids being formed by intensive drying of said pellet.

4,145,207

PREPARATION OF IMPROVED FOLIAR FERTILIZER

William P. Moore, P.O. Box 943, Hopewell, Va. 23860

Filed Jan. 19, 1977, Ser. No. 751,174

Int. Cl.[2] C05C *9/02*

U.S. Cl. 71—29 **2 Claims**

1. A stepwise method for preparation of a stable, non-burning urea-formaldehyde polymer-based, liquid foliar fertilizer, which comprises (1) dissolving urea and urea-formaldehyde concentrate in aqueous alkali solution at temperatures below 50° C., (2) adding polyphosphoric acid to rapidly reduce pH below 3, (3) maintaining temperature and pH constant for about 5 minutes, (4) allowing reaction temperature to gradually increase to about 70° C. while increasing pH of the mixture about 0.1 pH per 2° C. temperature rise, (5) cooling and adding minor amounts of water soluble aliphatic alcohols containing 1–4 molecular skeletal carbons, (6) neutralizing the reaction mixture with aqueous ammonia to pH 6.1–6.5, (7) blending with gelled attapulgite clay amounting to 0.5 to 2.0 percent of the fertilizer weight, and (8) removing any particles larger than 75 microns in diameter prior to storage or use.

4,145,208

METHOD AND COMPOSITION FOR IMPROVING THE FUNCTIONING OF DRIP IRRIGATION SYSTEMS

Arie Gulko, and Dahlia S. Greidinger, both of Haifa, Israel, assignors to Fertilizers & Chemicals Ltd., Haifa, Israel

Filed Dec. 15, 1977, Ser. No. 860,900

Claims priority, application Israel, Jan. 12, 1977, 51248

Int. Cl.[2] C05C *9/00*; C05B *15/00*

U.S. Cl. 71—29 **13 Claims**

1. A method for improving the smooth functioning of drip irrigation by applying a nitrogen-based composition being characterized by the fact that the said composition comprises urea nitrate which provides a pH ranging from about 0.05 to about 3.0, when urea nitrate is added to an aqueous solution in a quantity ranging from about 28 to 0.1 percent respectively based on the weight of the said aqueous solution.

4,145,209

MULTICOMPONENT FRUIT ABSCISSION COMPOSITIONS

Robert E. Holm, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 603,454, Aug. 11, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,382

Int. Cl.[2] A01N *5/00*

U.S. Cl. 71—92 **4 Claims**

1. A fruit abscission composition comprising cycloheximide and glyoxal dioxime, wherein the amount of said cycloheximide in said composition is not in excess of about 20 ppm and said dioxime is present in an amount in excess of the amount of said cycloheximide.

4,145,210

PROCESS FOR INDURATING DRIED PELLETS IN A ROTARY KILN

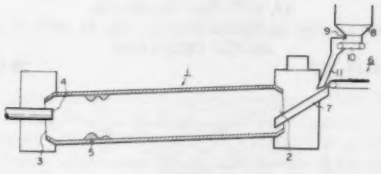
Kazumasa Kato, Wakayama, and Kenji Kadota, Niihama, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, and Sumitomo Heavy Industries, Ltd., Tokyo, both of Japan

Filed Feb. 22, 1977, Ser. No. 770,947

Claims priority, application Japan, Feb. 24, 1976, 51-19754

Int. Cl.[2] C22B *1/14*

U.S. Cl. 75—3 **3 Claims**

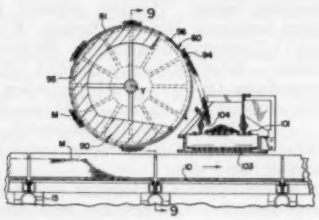


1. A process for indurating dried pellets in a rotary kiln, characterized by charging the dried pellets and coke in the range of from about 2% by weight to about 20% by weight on the weight of the pellets into the rotary kiln and heating the pellets in the kiln, the coke having a size of from about 5 millimeters to about 30 millimeters, a drum index (DI_5^{80}) of more than 70, a reactivity index (AG) of less than 50 and a tumbler index (TI_{50}^{400}) of more than 50.

4,145,211
METHOD FOR COOLING REDUCED METAL AGGLOMERATES

Charles A. Czako, Seven Hills; Andrejs Berzins, Parma, and Melvin J. Greaves, Cleveland, all of Ohio, assignors to Arthur G. McKee & Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 594,514, Jul. 9, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,467
Int. Cl.[2] C21B *13/00*; C22B *1/26*
U.S. Cl. 75—34 29 Claims



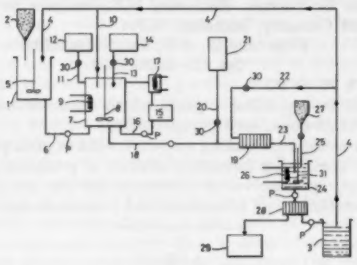
1. A method of cooling metallic agglomerates containing a major proportion by weight of metal resulting from direct reduction from an oxide of the metal, comprising reducing finely divided particles of metal oxide by reducing gas at an elevated temperature, agglomerating the reduced metallic particles while they are hot from the reducing step by subjecting them to agglomerating pressure in a non-oxidizing atmosphere to produce agglomerates having a minimal cross section of about ⅜ inch and a maximum cross section of about 4½ inches, disposing said hot agglomerates while they are at a temperature between approximately 1000° F. and 2000° F. in a moving bed in which the agglomerates are at rest relative to each other, and passing ambient atmospheric air through said bed at a velocity of about 500 feet to 1500 feet per minute that is sufficiently high to cool said agglomerates rapidly in a time of less than 10 minutes to a temperature no greater than about 500° F. without substantial reoxidation of the metal in said agglomerates and by using only said air as the cooling gas.

4,145,212
PROCESS FOR RECOVERING SILVER AND OPTIONALLY GOLD FROM A SOLID STARTING MATERIAL CONTAINING SAID METALS

Fernand J. J. Bodson, Angleur, Belgium, assignor to Societe des Mines et Fonderies de Zinc de la Vieille Montagne, Angleur, Belgium

Filed Oct. 18, 1977, Ser. No. 843,305
Claims priority, application Belgium, Oct. 19, 1976, 645724
Int. Cl.[2] C22B *11/04*
U.S. Cl. 75—118 R 15 Claims

1. A process for recovering silver and, when present gold, from a silver and, if present, gold bearing solid starting material, in which said metal(s) are present in low proportions, a part thereof being in the form of free sulphides, said process comprising dispersing the starting material in an aqueous solution of thiourea and adding an oxidizing agent to the aqueous solution obtained, so as to solubilize the silver and gold, if present, in the form of complexes with the thiourea; and subjecting the obtained solution to a cementation by means of a



metal so as to obtain a cement containing more than about 90% of silver.

4,145,213
WEAR RESISTANT ALLOY

Rolf G. Oskarsson, Rönninge, and Carl S. G. Ekemar, Lännersta, both of Sweden, assignors to Sandvik Aktiebolg, Sandviken, Sweden

Filed May 17, 1976, Ser. No. 687,341
Claims priority, application Sweden, May 16, 1975, 7505630
Int. Cl.[2] B22F *3/00*; C22C *29/00*
U.S. Cl. 75—238 6 Claims

1. An alloy consisting essentially of from 30 to 70 volume percent of grains of hard components in a metal binder, the hard components being predominantly nitride and/or carbonitrides and consisting essentially of a compound of at least one member of the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W and at least one member of the group consisting of C, N and B, in which alloy the molar ratio of N to N plus C is at least 0.6, the hard components have a mean grain size M within the range of 0.04 to 0.70 microns and a grain size distribution represented by the standard deviation S in which $S^2 = (m)/(1+1.5M^2)\mu m^2$, the number of hard component grains being greater than 1.2 μm being 15 percent or less,

the metal binder consisting essentially of Fe, Co or Ni and containing 10 atomic percent max. Al, 15 atomic percent max. Mn, 4 atomic percent max. Si and 1 atomic percent max. Cu,

the molar ratio (Ti + Zr + Hf + V + Nb + Ta + Cr + Mo + W + Al): (Fe + Co + Ni + Mn) being in the range of from 0.25 to 0.70, the molar ratio of (V + Nb + Ta + Cr + Mo + W): (Ti + Zr + Hf) being 0 to 1 and the molar ratio of (Ti + Zr + Hf + V + Nb + Ta): (Cr + Mo + W) in the hard components being greater than 25.

4,145,214
CO-CRYSTALLINE ORGANIC PHOTOCONDUCTORS AND HETEROGENEOUS COMPOSITIONS THEREOF

William E. Yoerger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 25, 1977, Ser. No. 800,509
Int. Cl.[2] G03G 5/06
U.S. Cl. 96—1 PC 18 Claims

1. A co-crystalline organic photoconductor comprising p-terphenyl doped with p-quaterphenyl.

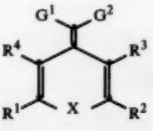
4. A method for making a co-crystalline organic photoconductor comprising forming a solution of p-terphenyl and p-quaterphenyl dissolved in a common solvent, and thereafter co-crystallizing said p-terphenyl and p-quaterphenyl.

4,145,215
MIGRATION IMAGING PROCESS AND COMPOSITIONS

James A. Van Allan; Frank G. Webster, and George A. Reynolds, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 15, 1977, Ser. No. 816,128
Int. Cl.[2] G03G 5/09
U.S. Cl. 96—1 PE 16 Claims

1. An electrophoretic migration imaging process which comprises subjecting an electrically photosensitive colorant material positioned between at least two electrodes to an applied electric field and exposing said materials to an image pattern of radiation to which the material is photosensitive, thereby obtaining image formation on at least one of said electrodes, the improvement which comprises using as at least a portion of said material, an electrically photosensitive material having the following structure:



wherein,

X represents O, S, Se or NR in which R represents a substituted or unsubstituted alkyl, aryl, aralkyl, cycloalkyl, alkenyl or alkynyl and said substituents are selected from the group consisting of hydroxy, alkoxy, aryloxy or halogen;

G^1 G^2, which may be the same or different represent an electron withdrawing group or when taken together with the carbon atom to which G^1 and G^2 are attached represent the nonmetallic atoms needed to complete a substituted or unsubstituted acidic heterocyclic nucleus selected from the group consisting of 1,3-indandione, pyrazolinone, isoxazolinone, oxindole, 2,4,6-triketohexahydropyrimidine, 2-thio-2,4-thiazolidinedione, 2,-thio-2,4-oxazolidinedione, thianaphthenone, 2-thio-2,5-thiazolidinedione, 2,4-thiazolidinedione, thiazolidinone, 4-thiazolinone, 2-amino-2-oxazolin-4-one; 2,4-imidazolidinedione; 2-thio-2,4-imidazolidinedione; 2-imidazolin-5-one; furan-5-one; and a heterocyclic nucleus containing 5 atoms in the heterocyclic ring, 3 of said atoms being carbon atoms, 1 of said atoms being a nitrogen atom and 1 of said atoms being selected from the group consisting of N, O and S.

R^1 and R^2, which may be the same or different, represent alkyl, aryl, $-CL^1(=CL^2CL^3)_m=A^1$ or $-CL^4=CL^5(-CL^6=CL^7)-_nA^2$ or R^1 together with R^4 or R^2 together with R^3 represent sufficient atoms to complete an alkylene bridge;

m and n represents 0, 1 or 2;

L^1, L^2, L^3, L^4, L^5, L^6, and L^7 which may be the same or different, represent hydrogen, alkyl and aryl; L^1 or L^4 together with R^3 or R^4 represent the atoms needed to complete a carbocyclic ring;

A^1 represents a basic substituted or unsubstituted nucleus selected from the group consisting of imidazole, 3H-indole, thiazole, benzothiazole, naphthothiazole, thianaphtheno-7',6',-4,5-thiazole, oxazole, benzoxazole, naphthoxazole, selenazole, benzoselenazole, naphthoselenazole, thiazoline, 2-quinoline, 4-quinoline, 1-isoquinoline, benzimidazole, 2-pyridine and 4-pyridine;

A^2 may be the same as A^1 and in addition represent substituted and unsubstituted nucleus selected from the group consisting of aryl, thiophene, benzo[b]thiophene, naphtho[2,3-b]thiophene, furan, isobenzofuran, chromene, pyran, xanthene, pyrrole, 2H-pyrrole, pyrazole, indolizine, indoline, indole, 3H-indole, indazole, carbazole, perimidine, isothiazole, isoxazole, furazan, chroman, isochroman, 1,2,3,4-tetrahydroquinoline, 4H-pyrrolo[3,2,1-ij]quinoline, 1,2-dihydro-4H-pyrrolo[3,2,1-ij]quinoline, 1,2,5,6-tetrahydro-4H-pyrrolo[3,2,1-ij]quinoline, 1H,5H-benzo[ij]quinolizine, 2,3-dihydro-1H,5H-benzo[ij]quinolizine, 2,3,6,7-tetrahydro-1H,5H-benzo[ij]quinolizine, 10,11-dihydro-9H-benzo[a]xanthen-8-yl and 6,7-dihydro-5H-benzo[a]pyran-7-yl;

R^3 represents hydrogen, or R^3 together with R^2, L^1 or L^4 and the carbon atoms to which they are attached, represent a substituted or unsubstituted 5 or 6-member carbocyclic ring;

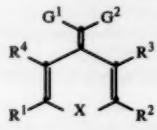
R^4 may be the same as R^3 when taken alone or together with R^1, L^1 or L^4, and

said substituents for G^1 and G^2 when taken together are selected from the group consisting of substituted or unsubstituted alkyl, aryl, aralkyl, cycloalkyl, alkenyl, alkynyl, dialkylamino, diarylamino and diaralkylamino and said substituents for A^1 and A^2 are the same as for G^1 and G^2 taken together plus amino, alkylamino, arylamino, aroalkylamino, alkoxy, aryloxy and alkoxy carbonyl; except that

(i) R^1 and R^2 cannot both be methyl, phenyl or methyl and phenyl and,

(ii) the substituents on A^1 and A^2 cannot result in a quaternary nitrogen.

11. An electrophoretic migration imaging dispersion comprising an electrically insulating carrier, a charge control agent and an electrically photosensitive colorant material having the structure:



wherein,

X represents O, S, Se or NR in which R represents a substituted or unsubstituted alkyl, aryl, aralkyl, cycloalkyl, alkenyl or alkynyl and said substituents are selected from the group consisting of hydroxy, alkoxy, aryloxy or halogen;

G^1 and G^2, which may be the same or different, represent an electron withdrawing group or when taken together with the carbon atom to which G^1 and G^2 are attached represent the nonmetallic atoms needed to complete a substituted or unsubstituted acidic heterocyclic nucleus selected from the group consisting of 1,3-indandione, pyrazolinone, isoxazolinone, oxindole, 2,4,6-triketohexahydropyrimidine, 2-thio-2,4-thiazolidinedione, 2-thio-2,4-oxazolidinedione, thianaphthenone, 2-thio-2,5-thiazolidinedione, 2,4-thiazolidinedione, thiazolidinone, 4-thiazolinone, 2-amino-2-oxazolin-4-one; 2,4-imidazolidinedione; 2-thio-2,4-imidazolidinedione; 2-imidazolin-5-one; furan-5-one; and a heterocyclic nucleus containing 5 atoms in the heterocyclic ring, 3 of said atoms being carbon atoms, 1 of said atoms being a nitrogen atom and 1

of said atoms being selected from the group consisting of N, O and S.

R^1 and R^2, which may be the same or different, represent alkyl, aryl, $—CL^1(=CL^2CL^3)=_mA^1$ or $—CL^4=CL^5(—CL^6=CL^7)—_nA^2$ or R^1 together with R^4 or R^2 together with R^3 represent sufficient atoms to complete an alkylene bridge;

m and n represent 0, 1 or 2;

L^1, L^2, L^3, L^4, L^5, L^6, and L^7, which may be the same or different represent hydrogen, alkyl and aryl; L^1 or L^4 together with R^3 or R^4 represent the atoms needed to complete a carbocyclic ring;

A^1 represents a basic substituted or unsubstituted nucleus selected from the group consisting of imidazole, 3H-indole, thiazole, benzothiazole, naphthothiazole, thianaphtheno-7′,6′,-4,5-thiazole, oxazole, benzoxazole, naphthoxazole, selenazole, benzoselenazole, naphthoselenazole, thiazoline, 2-quinoline, 4-quinoline, 1-isoquinoline, benzimidazole, 2-pyridine and 4-pyridine;

A^2 may be the same as A^1 and in addition represents a substituted and unsubstituted nucleus selected from the group consisting of aryl, thiophene, benzo[b]thiophene, naphtho[2,3-b]thiophene, furan, isobenzofuran, chromene, pyran, xanthene, pyrrole, 2H-pyrrole, pyrazole, indolizine, indoline, indole, 3H-indole, indazole, carbazole, perimidine, isothiazole, isoxazole, furazan, chroman, isochroman, 1,2,3,4-tetrahydroquinoline, 4H-pyrrolo[3,2,1-ij]quinoline, 1,2-dihydro-4H-pyrrolo[3,2,1-ij]quinoline, 1,2,5,6-tetrahydro-4H-pyrrolo[3,2,1-ij]quinoline, 1H,5H-benzo[ij]quinolizine, 2,3-dihydro-1H,5H-benzo[ij]quinolizine, 2,3,6,7-tetrahydro-1H,5H-benzo[ij]quinolizine, 10,11-dihydro-9H-benzo[a]xanthen-8-yl and 6,7-dihydro-5H-benzo[a]pyran-7-yl;

R^3 represents hydrogen, or R^3 together with R^2, L^1 or L^4 and the carbon atoms to which they are attached, represent a substituted or unsubstituted 5 or 6-member carbocyclic ring;

R^4 is selected from the same group as R^3, when taken alone or together with R^1, L^1 or L^4, and

said substituents for G^1 and G^2 when taken together are selected from the group consisting of substituted or unsubstituted alkyl, aryl, aralkyl, cycloalkyl, alkenyl, alkynyl, dialkylamino, diarylamino and diaralkylamino and said substituents for A^1 and A^2 are the same as for G^1 and G^2 taken together plus amino, alkylamino, arylamino, aroalkylamino, alkoxy, aryloxy and alkoxy carbonyl; except that

(i) R^1 and R^2 cannot both be methyl, phenyl or methyl and phenyl respectively and,

(ii) the substituents on A^1 and A^2 cannot result in a quaternary nitrogen.

4,145,216

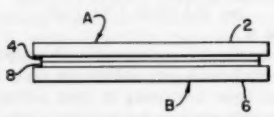
DRY TRANSFER IMAGE SYSTEMS

Richard E. Merrill, Wakefield, and Theodore H. Krueger, Wayland, both of Mass., assignors to Seal Incorporated, Naugatuck, Conn.

Division of Ser. No. 628,506, Nov. 3, 1975, Pat. No. 4,081,282. This application Sep. 30, 1977, Ser. No. 838,109

Int. Cl.[2] G03C *5/00, 11/12*

U.S. Cl. 96—28 **20 Claims**



8. A method of forming and transferring images comprising:

providing a photo-active component and a transferable component, said photo-active component comprising a first carrier sheet coated with a tacky layer of an unexposed photopolymerizable material and said transferable component comprising a layer of a frangible, non-photopolymerizable transferable material on a second carrier sheet, said components being disposed so that said photopolymerizable and transferable layers confront and are in contact with one another, irradiating said layer of photopolymerizable material so as to cause selected portions of said photopolymerizable material to harden and bond to selected confrontin portions of said layer of said transferable material, and separating said components so that the selected confronting portions of said layer of transferable material separate from said second carrier sheet and the rest of said layer of transferable material remains on said second carrier sheet.

9. The method of claim 8 wherein a thin film of said photopolymerizable material adheres to said layer of transferable material on said second carrier sheet in areas other than the area of said selected confronting portions when said components are separated.

4,145,217

QUINOXALINES AND THEIR USE IN PHOTOGRAPHIC PROCESSES

Gerald Jan; Remon Hagen, and John Lenoir, all of Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

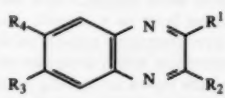
Filed May 20, 1977, Ser. No. 799,033

Claims priority, application Switzerland, May 24, 1976, 6520/76

Int. Cl.[2] G03C *7/00, 5/32*

U.S. Cl. 96—53 **9 Claims**

1. Process for the production of colored photographic images by the silver dye bleach process which comprises the steps of imagewise exposing a photographic material containing on a substrate, at least one silver halide emulsion layer with a bleachable dyestuff, then (1) developing the silver image obtained, (2) dye bleaching and silver bleaching said silver image, (3) silver fixing and (4) washing, said dye and/or silver bleaching step being carried out in a bath containing at least one bleach catalyst of the formula



in which R_1 is hydrogen, $—CH_2OR$, $—CH_2NRR'$, $—CH_2OCOR$, $—CH_2Cl$, $—CH_2Br$, $—CH_2CN$, $—CH_2SR$, $—CH_2SCN$, $—CH_2O(CH_2)_mOR$, $—CH_2(OCH_2CH_2)_nOR$, $—CH_2SO_2B_5$, $—CH_2PO(OR_5)_2$, $—CH_2SO_3R_6$ or $—CH_2PO(OR_6)_2$, R_1 being hydrogen only when R_3 and R_4 conjointly are $—O(CH_2)_pO—$, and R_2 is methyl and $—CH_2PO(OR_5)_2$, $—CH_2PO(OR_6)_2$ or $CH_2SO_3R_6$, and R_3 and R_4 independently are alkyl with 1 to 5 carbon atoms, alkoxy with 1 to 4 carbon atoms, $RO(CH_2)_mO—$ or $RO(CH_2CH_2O)_n—$or R_3 and R_4 conjointly are $—O(CH_2)_pO—$, R and R′ independently are hydrogen or alkyl with 1 to 4 carbon atoms, R_5 is alkyl with 1 to 4 carbon atoms, R_6 is hydrogen, an alkali metal cation or $—N^{\oplus}(R)_4$, m is 3 or 4, n is 1 to 3 and p is 1 or 2.

4,145,218

PROCESS FOR DEVELOPING LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Teiji Habu; Masashi Nakano; Yasuo Tsuda; Eiichi Sakamoto, and Hiroshi Yamada, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1977, Ser. No. 827,988

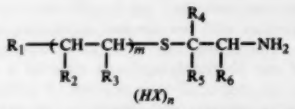
Claims priority, application Japan, Sep. 2, 1976, 51-105275

Int. Cl.[2] G03C *5/30, 1/06, 1/48*

U.S. Cl. 96—66.3 **6 Claims**

1. A process for developing an image-wise exposed light-sensitive silver halide photographic material with a developing solution containing an aldehyde hardening agent in the pres-

ence of one or more of compounds having the following formula:



in which R_1 represents a substituted carbamoyl group, a cyano group, a nitrogen-containing 5-10 membered heterocyclic group, —COOM or —COOR; each of R_2 and R_3 represents hydrogen, an alkyl group, a substituted or unsubstituted carbamoyl group, a cyano group, —COOM or —COOR; each of R_4 and R_5 represents hydrogen or an alkyl group; and R_6 represents hydrogen or —COOM; wherein M represents hydrogen, an alkali metal or ammonium ion, R represents a lower alkyl or aryl group; X represents a chlorine ion; and each of m and n is 0 or 1, and when M represents an alkali metal or ammonium ion, n is 0,

said compound being present in the photographic material or in the developing solution.

4,145,219

MULTILAYER COLOR SENSITIVE MATERIALS

Takeshi Kato; Akira Tanaka; Jun Hayashi, and Akikazu Mikawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 7, 1977, Ser. No. 813,738

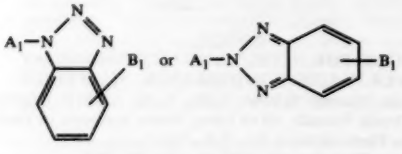
Claims priority, application Japan, Jul. 7, 1976, 51-81142

Int. Cl.[2] G03C *1/10, 1/34, 1/76*

U.S. Cl. 96—74 **12 Claims**

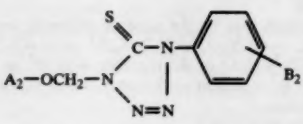
1. In a silver halide multilayer color light-sensitive material comprising a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a blue-sensitive silver halide emulsion layer on a support, wherein each silver halide emulsion layer contains a non-diffusible image forming coupler, the improvement which comprises at least one of said silver halide emulsion layers comprising an upper unit silver halide emulsion layer, a middle unit silver halide emulsion layer and a lower unit silver halide emulsion layer, in which the sensitivity of the three unit silver halide emulsion layers decreases in order from the upper unit silver halide emulsion layer to the lower unit silver halide emulsion layer, wherein said upper unit silver halide emulsion layer comprises a layer of a high speed silver halide emulsion wherein more than about 3% based on the total grains in the upper unit silver halide emulsion comprises silver halide grains having a grain size of about 2.0μ or larger, and at least the middle unit silver halide emulsion layer contains at least one development inhibitor releasing compound selected from the compounds represented by the following general formulae (VII)-(X);

(VII)



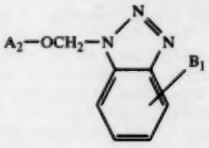
wherein A_1 represents a yellow coupler residue, a magenta coupler residue, a cyan coupler residue, a malondiimide coupler residue, a malondiester coupler residue or an indanone coupling compound residue, and B_1 represents a bromine atom, an acylamino group, a benzothiazolinylideneamino group or an aralkyloxy group;

(VIII)



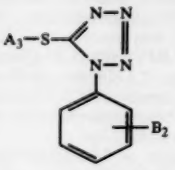
wherein A_2 represents a cyan coupler residue, and B_2 represents a halogen atom, a nitro group, an alkoxy group, an alkyl group, an amino group or an acylamino group;

(IX)



wherein A_2 has the same meaning as in the general formula (VIII) and B_1 has the same meaning as in the general formula (VIII); and

(X)



wherein B_2 has the same meaning as in the general formula (VIII) and A_3 represents a yellow coupler residue, a magenta coupler residue, a cyan coupler residue, a malondiimide coupler residue, a malondiester coupler residue, an indanone coupling compound residue or an α-(2-benzothia (or benzooxa)acetanilide) type coupler residue.

4,145,220

SILVER HALIDE ELEMENT WITH POLYMERIC MORDANTING AGENTS FOR ANIONIC COMPOUNDS

Daniel M. Timmerman; Walter F. De Winter, both of Mortsel, and Albert E. Van Hoof, Berchem, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

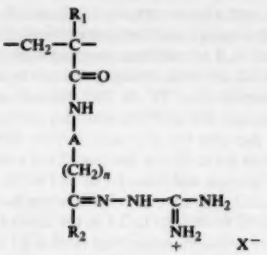
Filed Dec. 30, 1971, Ser. No. 213,990

Claims priority, application United Kingdom, Jan. 11, 1971, 1288/71; Sep. 10, 1971, 42381/71

Int. Cl.[2] G03C *1/84, 1/10*

U.S. Cl. 96—84 A **14 Claims**

1. A color-developable radiographic silver halide element comprising a colorless support, at least one silver halide emulsion layer, said layer containing at least one anionic color coupler which will produce by coupling with an oxidized aromatic primary amino developing agent a monochromic dye image mainly absorbing in the red and green spectral regions, and a protective hydrophilic colloid layer coated over the said emulsion layer wherein the said emulsion layer and/or the protective colloid layer comprises a polymer having recurring units of the general structure:



wherein:

R_1 stands for hydrogen or alkyl,

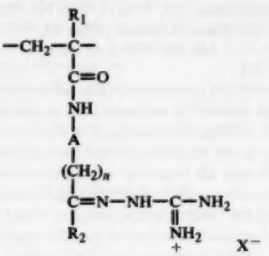
A is methylene or methylene substituted by lower alkyl,

n stands for 0 or 1,

R_2 is alkyl, and

X is an acid radical.

8. A light-sensitive photographic element comprising a support and at least one silver halide emulsion layer containing an anionic color coupler and said element comprising a polymer having recurring units of the general structure:



wherein:

R_1 stands for hydrogen or alkyl,

A is methylene or methylene substituted by lower alkyl,

n stands for 0 or 1,

R_2 is alkyl, and

X is an acid radical.

4,145,221

SYNTHETIC POLYMER LATICES IN PHOTOGRAPHIC SILVER HALIDE EMULSIONS CONTAINING MULTIVALENT METAL SALTS

Jui-Chang Chuang, Vestal, and Donald E. Trucker, Binghamton, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 8, 1977, Ser. No. 849,652

Int. Cl.² G03C 1/72, 1/38, 1/06

U.S. Cl. 96—95 **13 Claims**

1. Gelatino silver halide photographic emulsions containing salts of multivalent metal in which the gelatin is partially replaced by a terpolymer latex consisting of, by weight, 40–90% acrylates, 5–50% glycidyl acrylates and 1–20% acrylamides and where in the terpolymer latex contains an anionic sulfate-type surfactant in an amount, by weight, based on the weight of polymer solids of from 0.5 to 10%.

4,145,222

WATER SOLUBLE PHOTOSENSITIVE RESIN COMPOSITION COMPRISING A POLYAMIDE OR ITS AMMONIUM SALT

Kuniomi Etoh, and Masaru Nanpei, both of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 525,106, Nov. 19, 1974, abandoned. This application Mar. 25, 1977, Ser. No. 781,307

Int. Cl.² G03C 1/68

U.S. Cl. 96—115 P **16 Claims**

1. A water-soluble photosensitive resin composition which comprises a polyamide or its ammonium salt having recurring amide groups in the main chain thereof and basic nitrogen atoms in the main or side chain thereof, from 5 to 150% by weight with respect to said polyamide or its ammonium salt of a photopolymerizable unsaturated monomer and from 0.1 to 5% by weight with respect to the total amount of said polyamide or its ammonium salt and the photopolymerizable unsaturated monomer, of a photosensitizer, said polyamide being prepared by the polycondensation of starting monomers comprising from 10 to 100 mol % of a compound having the following formula:

(I)

wherein R and R′ are each a hydrogen atom or a hydrocarbon group, R_1^a and R_2^a are each an alkylene group, and A and B are each $-NH_2$, —COOH or —COOR″ wherein R″ is a hydrocarbon group, and in which the group $-R_2^a-B$ may represent a hydrogen atom, and said ammonium salt being prepared by the treatment of said polyamide with a protonic acid, a quaternizing agent or an epoxy compound and a protonic acid.

4,145,223

FRICTIONAL MATERIAL FOR BRAKES

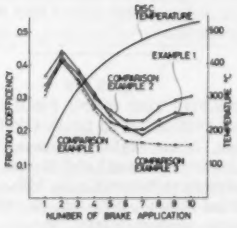
Koichi Iwata, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 28, 1977, Ser. No. 846,472

Claims priority, application Japan, Nov. 25, 1976, 51-141921

Int. Cl.² C09K 3/14

U.S. Cl. 106—36 **5 Claims**



1. A frictional material for brakes employing as a reinforcing material a fibrous material selected from the group consisting of glass fiber, steel wire, organic synthetic fiber and ceramic fiber and containing non-fibrous serpentine by 5 to 80% in contents by volume.

4,145,224

METHOD FOR ENHANCING THE CRYSTALLIZATION RATE OF HIGH PURITY AMORPHOUS Si_3N_4 POWDER, POWDERS PRODUCED THEREBY AND PRODUCTS THEREFROM

Emil J. Mehalchick, and Richard N. Kleiner, both of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 22, 1974, Ser. No. 526,257
Int. Cl.[2] C04B *35/58*
U.S. Cl. 106—73.3 4 Claims

1. Si_3N_4 powder having particles up to 1.0 microns in size, having a purity of at least 99.9 percent, and characterized by additionally containing at least 0.01 weight percent titanium.

4,145,225

METHOD OF MODIFYING THE PROPERTIES OF CEREAL FLOURS AND THE MODIFIED FLOURS SO PRODUCED

Peter J. Ferrara, Ridge Rd., Cornwall, N.Y. 12518

Filed Jul. 27, 1977, Ser. No. 819,600
Int. Cl.[2] C08L *89/00*
U.S. Cl. 106—154 R 7 Claims

1. A method of improving the physical properties of cereal flours which comprises treating such cereal flours with gaseous cyanide for at least about 10 minutes which is a time sufficient to produce a modified cereal flour having an elevated paste viscosity.

4,145,226

INK REMOVER

Melvin A. Neuhaus, 703 Oban, San Antonio, Tex. 78216

Filed Sep. 30, 1977, Ser. No. 838,155
Int. Cl.[2] C09K *3/00*; D21C *3/20*
U.S. Cl. 106—287.24 8 Claims

1. An ink remover comprising
a glycol ether selected from the group consisting of diethylene glycol monoethyl ether and diethylene glycol diethyl ether,
isopropyl acetate, and
a liquid surfactant soluble in hydrocarbons.

4,145,227

FIBROUS DISPERSION AID FOR THERMOPLASTICS

Leon Segal, Morristown, and Albert H. Steinberg, Morris Plains, both of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Division of Ser. No. 609,463, Sep. 2, 1975, Pat. No. 4,015,039, which is a division of Ser. No. 375,430, Jul. 2, 1973, Pat. No. 3,931,094. This application Nov. 12, 1976, Ser. No. 741,169
Int. Cl.[2] C09C *1/42*
U.S. Cl. 106—288 B 10 Claims

1. A filler premix for use in thermoplastic molding compositions consisting essentially of 82–93.3% particulate filler and 0.7–18% fibrous dispersion effecting material selected from the group consisting of glass fiber, aluminum whiskers, and silicon carbide fiber having an aspect ratio at least about ten times the aspect ratio of the filler.

4,145,228

PROCESS FOR THE JOINT PRODUCTION OF AROMATIC AMINES AND IRON OXIDE PIGMENTS

Piero D. Croce, Milan; Tullio Pellizzon, Paderno Dugnano (Milan); Peter Schwarz, and Luigi Piccolo, both of Milan, all of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Nov. 17, 1977, Ser. No. 852,264
Claims priority, application Italy, Nov. 19, 1976, 29541 A/76
Int. Cl.[2] C09C *1/24*
U.S. Cl. 106—304 17 Claims

1. A process for the joint production of aromatic amines and iron oxide pigments, which comprises bringing into contact a ferrous salt, a reduceable aromatic nitrogen compound selected from the group consisting of aromatic nitroderivatives with a single nitro-group or two nitro-groups and aromatic azoderivatives, and a basic compound selected from the group consisting of hydroxides and carbonates of alkali metals, alkaline earth metals and ammonium, reacting said nitrogen compound, ferrous salt and basic compound in an aqueous medium at a temperature of from 25° to 200° C. with a molar ratio between ferrous salt and aromatic nitrogen compound of from 3:1 to 15:1 in the case (a) of a nitroderivative with a single nitro-group, from 6:1 to 30:1 in the case (b) of a nitroderivative with two nitro-groups, and from 2:1 to 10:1 in the case (c) of an azoderivative, and with a molar ratio between basic compound and ferrous salt of from 1.8:1 to 3:1 in the case of a basic compound with a monovalent cation and from 0.9:1 to 1.5:1 in the case of a basic compound with a divalent cation, and recovering the amine and iron oxide pigment thus obtained from the reaction products.

4,145,229

PROCESS FOR THE PREPARATION OF THERMOSTABLE BLACK AND BROWN PIGMENTS AND THE PIGMENTS SO PRODUCED

Francesco Ferrero; Giuseppe Sironi, and Bruno Viviani, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 685,071, May 10, 1976, abandoned. This application Jul. 7, 1977, Ser. No. 813,452
Claims priority, application Italy, May 13, 1975, 23258 A/75
Int. Cl.[2] C04B *31/02*
U.S. Cl. 106—304 4 Claims

1. A process for the preparation of black and brown thermostable pigments consisting essentially of mixed phases of iron and manganese oxides, characterized in that

a. pyrolusite, in the form of particles having a mean diameter between 5 and 20 microns, is mixed and maintained in contact together with heptahydrated ferrous sulphate and between 0.5% and 5% by weight, based on the final weight of product, of one or more compounds selected from the group consisting of $FeCl_2$, SiO_2, $FeCl_3$, and Fe_3O_4, at a temperature between room temperature and 95° C.; and

b. the mass thereby obtained is dried, crushed and screened, and then calcined in the presence of air in a fluidized bed reactor at a temperature between 800° and 900° C. under fluidizing conditions for a period between one and six hours.

4,145,230

METHOD FOR SEEDING SUPER-SATURATED SUGAR SOLUTION TO EFFECT CRYSTALLIZATION

Rud F. Madsen; Ernst Knovl; Günther R. Möller, and Werner K. Nielsen, all of Nakskov, Denmark, assignors to Aktieselskabet de Danske Sukkerfabrikker, Copenhagen, Denmark

Filed May 20, 1977, Ser. No. 798,862
Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2269/76
Int. Cl.[2] C13F *1/02*
U.S. Cl. 127—60 4 Claims

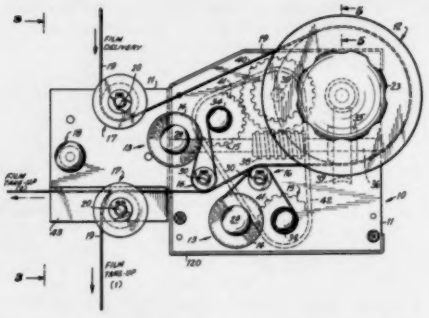
1. A method for the seeding of a super-saturated sugar solution to effect a crystallization therein, said method comprising the step of adding to said solution finely milled sugar suspended in a liquid which is wholly or partially soluble in water, which does not significantly dissolve sugar crystals and which has a boiling point which is higher than the temperature of the sugar solution to be crystallized, the suspension agent and the amount of suspended fine crystallized sugar being such that the viscosity of the suspension is sufficiently low so as to permit the suspension to spread in the sugar solution to be crystallized and sufficiently high so as to form a suspension which is stable for longer periods when being subjected to a slow flowing movement.

4,145,231

FILM DRIVEN FILM CLEANER

Harry W. Heckman, Seaford, N.Y., assignor to B-H Instrument Company, Inc., Massapequa, N.Y.

Continuation of Ser. No. 713,588, Aug. 11, 1976, abandoned.
This application Oct. 19, 1977, Ser. No. 843,583
Int. Cl.[2] B08B 1/02
U.S. Cl. 134—9 15 Claims



13. A method of cleaning film moving along a path in a film delivery and take-up system, said film delivery and take-up system including means for moving the film along the film path, comprising the steps of

driving a first roll rotatably mounted on its axis in the film path by holding a side surface of the film in contact with a cylindrical circumferential surface of the first roll so that the first roll is rotated about its axis solely by frictional engagement of the side surface of the film in contact with the cylindrical surface of the roll;

contacting each surface of the film to be cleaned with a cleaning tape, the tape being wound at one end on a spool and at the other end on a take-up roll;

driving a gearing mechanism by connecting the gearing mechanism to the driven first roll; and

driving the take-up roll by connecting the take-up roll to the driven gearing mechanism to draw the tape from the spool;

whereby the take-up roll is driven by the film-driven, first roll and an essentially clean portion of the tape contacts the film moving along the path.

4,145,232

PROCESS FOR CARBURIZING STEEL

Jack Solomon, Rye, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,202
Int. Cl.[2] C21D 1/56
U.S. Cl. 148—16.5 11 Claims

1. In a process for carburizing steel in a furnace having at least one carburizing chamber, said chamber being closed except for at least one passage through which the steel passes into and out of the chamber and having means for opening and closing the passage, said process comprising the following steps:

(a) opening the passage;

(b) introducing the steel through the passage into the chamber;

(c) closing the passage;

(d) introducing a carrier gas and a gaseous hydrocarbon into the chamber to provide a carburizing atmosphere, said carrier gas being introduced at a high flow rate when the passage is open and at a low flow rate when the passage is closed with the minimum high flow rate being sufficient to essentially prevent oxidation and decarburizing of the steel, and said atmosphere comprising:

component of atmosphere	percent by volume
carbon monoxide	about 4 to about 30
hydrogen	about 10 to about 60
nitrogen	about 10 to about 85
carbon dioxide	0 to about 4
water vapor	0 to about 5
hydrocarbon	about 1 to about 10,

said percent by volume being based on the total volume of the atmosphere;

(e) exposing the steel to the carburizing atmosphere at a temperature in the range of about 1200° F. to about 2200° F. until the steel is carburized;

(f) opening the passage;

(g) withdrawing the steel through the passage; and

(h) closing the passage, the improvement comprising:

(i) providing hydrocarbon in an amount sufficient to maintain

Z_A at a level about equal to $(K_A/100)(X^2/Y_g)$ wherein:

Z_A is the percent by volume of carbon dioxide;

X is the percent by volume of carbon monoxide;

K_A is the equilibrium constant for the reaction $2\,CO \rightleftarrows C + CO_2$;

Y is a predetermined percent by weight of carbon that is to be present on the surface of the steel, based on the weight of the steel; and

g is the activity coefficient for carbon dissolved in the steel;

(ii) providing a minimum low flow rate of carrier gas sufficient to limit the oxygen species entering the atmosphere whereby an amount of no greater than about 10 percent hydrocarbon, as a component of atmosphere, will be required to maintain the value of Z_A as set forth above; and

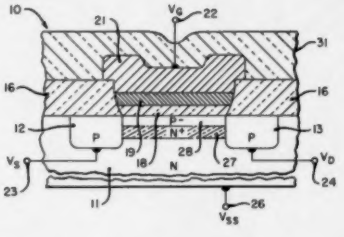
(iii) providing a maximum low flow rate of carrier gas no greater than about one half of the minimum high flow rate of the carrier gas.

4,145,233

METHOD FOR MAKING NARROW CHANNEL FET BY MASKING AND ION-IMPLANTATION

Stephen A. Sefick, Dayton, and Robert K. Jones, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed May 26, 1978, Ser. No. 909,868
Int. Cl.[2] H01L 21/26, 21/265
U.S. Cl. 148—1.5 26 Claims



1. In a method for forming a semiconductor device having an electrode structure formed over a channel region in a semiconductor body, the semiconductor body having a layer of oxide formed over the channel region thereof, the improvement wherein the channel region comprises at least two sections having different threshold voltages, including a section having an effective width of a predetermined dimension, comprising:

forming a mask over the oxide layer on the semiconductor body, the mask having a first aperture having sides such that the width of the aperture is less than the channel region width;

etching the oxide layer via the first aperture to form a second aperture therein, at least one side of the second aperture being spaced a predetermined distance outside the corresponding side of the first aperture;

depositing in the semiconductor body via the first aperture impurities of a first conductivity type to form a first channel region section extending the length of the channel region and having a width smaller than the width of the channel region;

removing the mask; and

forming the electrode structure to encompass the aperture of the masking oxide layer.

4,145,234

PROCESS FOR PROVIDING ALUMINUM SUBSTRATES WITH LIGHT-ABSORPTIVE SURFACE LAYER

Herbert Meissner, Braunau am Inn, Austria, assignor to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengeseilschaft, Braunau am Inn, Austria

Filed Mar. 1, 1978, Ser. No. 882,339

Int. Cl.[2] C23F *7/06, 5/02*

U.S. Cl. 148—6.27 **6 Claims**

1. A process for providing a substrate of aluminum with a dark surface layer of high absorption/emission ratio for luminous energy, comprising the steps of immersing said substrate in an oxidizing bath for a period just sufficient to form an oxide coating of not more than about 2.5μ on a surface thereof, rinsing the surface so coated, and thereafter immersing said substrate in an acidic aqueous solution of potassium permanganate and a nitrate of cobalt or copper, said solution having a pH between substantially 0.5 and 5 and a temperature between substantially 90° and 100° C., the proportion of potassium permanganate in said solution ranging between substantially 1 and 200 grams per liter, the proportion of the nitrate in said solution ranging between substantially 1 and 100 grams per liter.

4,145,235

PROCESS FOR PRODUCING COLD ROLLED STEEL SHEET AND STRIP HAVING IMPROVED COLD FORMABILITIES

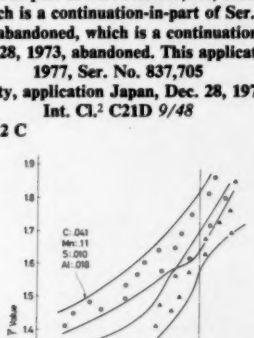
Hisashi Gondo; Hiroshi Takechi; Mitsunobu Abe, and Kazuo Namba, all of Kisarazu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 648,668, Jan. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 600,429, Jul. 30, 1975, abandoned, which is a continuation of Ser. No. 429,200, Dec. 28, 1973, abandoned. This application Sep. 29, 1977, Ser. No. 837,705

Claims priority, application Japan, Dec. 28, 1972, 47-130220

Int. Cl.[2] C21D *9/48*

U.S. Cl. 148—12 C **7 Claims**



1. A method for producing a cold rolled steel sheet having excellent cold-formability comprising;

hot rolling an aluminum killed steel slab,

coiling the hot rolled band at a temperature not lower than 735° C. to produce a manganese sulfide particle distribution of at least 5 particles per $4 \times 10^{-7}mm^2$,

the manganese sulfide particles having a diameter not larger than 300Å,

cold rolling the hot rolled band into a strip,

heating the cold rolled strip to a temperature from about 750° C. to 850° C. to effect recrystallization annealing,

and then cooling the strip from said annealing temperature at an average cooling rate from at least about 5°–30° C./sec. to a temperature between over-aging temperature and not less than 200° C.,

and then over-aging the strip at a temperature ranging from about 350° C. to 650° C.,

said steel slab comprising;

C: about 0.02–0.08%

Mn: about not more than 0.25% with a Mn/S = about 7 to 30

Al: not more than about 0.07 with the balance being iron and unavoidable impurities.

4,145,236

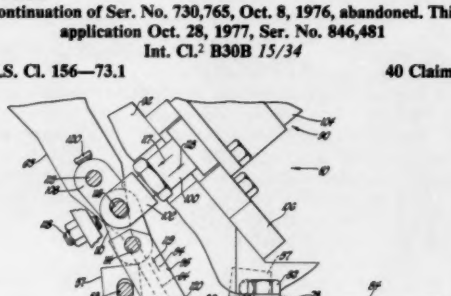
CARTON SEALING METHOD AND APPARATUS

Jack M. Neumayer, Wixom, and Ivan L. Kauffman, Union Lake, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 730,765, Oct. 8, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,481

Int. Cl.[2] B30B *15/34*

U.S. Cl. 156—73.1 **40 Claims**



35. A method of forming seals between the layers of the end closures of thermoplastic coated paperboard cartons by vibration welding comprising the steps of: moving each carton into a position in which its end closure is disposed between the spaced apart work surfaces of a vibrating horn and back-up member; pretriggering the horn to energize it and cause it to vibrate at a predetermined frequency; moving the work surfaces of the back-up member and energized horn into opposed, clamping relationship with the layers of the end closure at a clamping pressure within predetermined limits over the entire area of the layers between the work surfaces; holding the energized horn in said clamping relationship for a predetermined period of time to activate the thermoplastic coating to flow; de-energizing the horn while still in the clamping position and holding the de-energized horn in said clamping position for a predetermined period of time to permit the activated thermoplastic to partially set; separating the work surfaces of the de-energized horn and back-up member; moving the carton with the partially activated thermoplastic to a cooling and clamping station with the end closure disposed between the spaced apart work surfaces of a pressure pad and back-up member; moving the work surfaces of the pressure pad and back-up member into opposed, clamping relationship with the layers of the end closure at a predetermined clamping pressure;

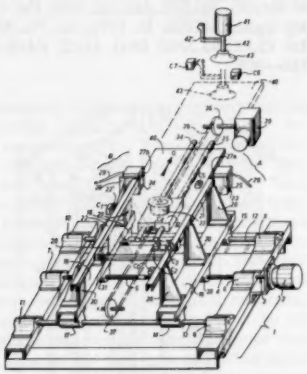
holding the pressure pad in said clamping relationship for a predetermined period of time to permit the thermoplastic to complete this set; and then separating the work surfaces of the pressure pad and back-up member to permit the carton end closure to be moved from the clamping and sealing station.

4,145,237

METHOD AND APPARATUS FOR SIMULTANEOUSLY SEALING TWO EDGES OF A MULTIPLE PANE WINDOW

Alain Mercier, Courbevoie, and Yves Fournier, Chalon-sur-Saone, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Oct. 9, 1975, Ser. No. 621,026
Claims priority, application France, Oct. 10, 1974, 74 34156
Int. Cl.[2] E06B *3/63*; C03C *27/00*
U.S. Cl. 156—107 **14 Claims**



1. A method for applying sealing material between the panes of a multiple-pane window simultaneously at two opposing parallel edges thereof which comprises:

(a) moving a multiple-pane window in a path of travel parallel to said two opposite edges thereof and between a pair of opposed extrusion nozzles adjacent said opposite edges,

(b) centering said window using centering means having a pair of frames upstream of and attached to said nozzles and include engaging means mounted for pivotal movement for engaging said opposite parallel edges of said window, said frames mounted for movement toward and away from each other in parallel relationship by a lead screw having threads of opposite hand,

(c) maintaining a substantially fixed lateral separation of said nozzles during the travel of said window therebetween, and

(d) actuating said extrusion nozzles simultaneously to deposit sealing material from end to end of said opposite edges.

3. Apparatus for applying material between the panes of a multiple-pane window simultaneously at two opposite parallel edges thereof which comprises:

(a) a pair of opposed extrusion nozzles spaced apart laterally of the direction of travel of a multiple-pane window and maintained with a substantially fixed lateral separation during the travel of the window therebetween

(b) centering means upstream of and attached to said nozzle for engaging opposite edges of said window and centering the window for passage between said nozzles said centering means includes: a pair of frames mounted for movement toward and away from each other in parallel relationship and include engaging means mounted for pivotal movement for engaging said opposite parallel edges of said window, said frames are coupled by a lead screw having threads of opposite hand longitudinally spaced thereon, said frames carrying cooperating threads of opposite hand respectively, and driving means for driving said lead screw in either direction, and

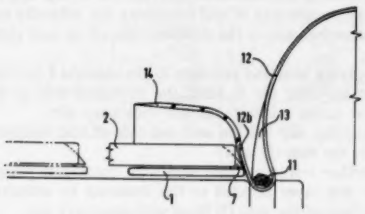
(c) carrier means for fixedly engaging said window between said edges thereof and moving the window parallel to said edges past and between said centering means and said nozzles.

4,145,238

PROCESS AND APPARATUS FOR TURNING-UP THE SIDEWALLS AND BODY PLIES OF FABRIC FOR TORUS-SHAPED VEHICLE TIRE

Franco Bottasso, and Bruno Colombani, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Mar. 2, 1977, Ser. No. 773,793
Claims priority, application Italy, Mar. 5, 1976, 20885 A/76
Int. Cl.[2] B29H *17/12*
U.S. Cl. 156—132 **13 Claims**



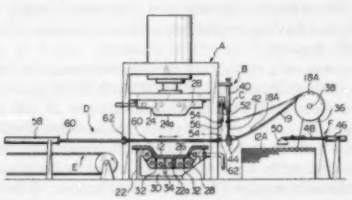
1. In a process for making a vehicle tire wherein strips to form the sidewalls of the tire, and the plies of material which will form the body of the tire are arranged symmetrically on an expandable drum divided into a central zone and two end zones, bead cores are placed on the resulting assembly and the expandable drum is expanded in the central zone to lock the plies of material against the bead cores and shape the body and expanded in the end zones to arrange the ends of the plies and said sidewall strips in a parabolic configuration, the improvement wherein the end zones of the drum are contracted after shaping of the body into a parabolic shape to produce an annular space between the drum and the inner surface of the end of the plies forming the body and the sidewall strips, and then the ends of the plies of the material forming the body and the sidewall strips are folded from within the parabola over and against the surface of the shaped body.

4,145,239

METHOD AND APPARATUS FOR PRODUCTION OF LAMINATED AND SHAPED WALL COVERING BOARD OF CORRUGATED PAPERBOARD BASE

Toshihiko Fujii, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 20, 1977, Ser. No. 817,493
Claims priority, application Japan, Jul. 21, 1976, 51-87068
Int. Cl.[2] B29C *3/04*
U.S. Cl. 156—212 **18 Claims**



1. A method of producing a shaped wall covering board which is composed of a substrate of corrugated paperboard and a skin layer intimately laid on one side of the substrate for

decorative, cushioning and/or protective effects, the method comprising the steps of:

(a) placing the substrate on a stationary die of a hot-press which has also a movable die;

(b) supporting a belt of a sheet material employed as the skin at one end thereof with friction force such that said one end is positioned on one side of said stationary die substantially in a plane which interposes between said stationary and movable dies in the parted state and is approximately normal to the direction of the movement of said movable die;

(c) extending an arm having a sheet-grasping mechanism at one end thereof substantially in said plane from the opposite side of said stationary die to grasp said one end of said belt by said mechanism;

(d) providing a layer of an adhesive material which is operative at an elevated temperature between said belt and the substrate placed on said stationary die prior to the step (c);

(e) retreating said arm until said one end of said belt reaches said opposite side of said stationary die, whereby said belt is stretched above the substrate placed on said stationary die;

(f) applying heat and pressure to the stretched belt through said movable die to bond the stretched belt as the skin layer to the substrate on said stationary die;

(g) severing said belt on said one side of said stationary die after the step (f); and

(h) further retreating said arm with continued grasping of the skin layer bonded to the sbustrate to withdraw the product of the step (f) from said stationary die.

4,145,240

PROCESS FOR THE MANUFACTURE OF AN ARTICLE OF LAMINATED PLASTICS HAVING IMPROVED SURFACE CHARACTERISTICS

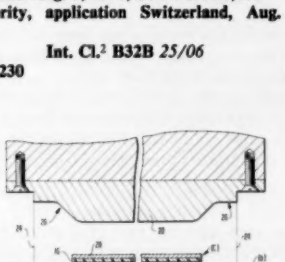
Renée Polzin, Pregassona, Switzerland, assignor to Plama Plastic Metallic Limited, St. Peter Port, Channel Islands

Filed Aug. 5, 1977, Ser. No. 822,171

Claims priority, application Switzerland, Aug. 5, 1976, 9975/76

Int. Cl.[2] B32B *25/06*

U.S. Cl. 156—230 **11 Claims**



1. A process for the manufacture of an article made of laminated plastics having improved surface characteristics, comprising the steps of:

(A) forming on a temporary flexible support, of a vulcanisable coating, cohesive and adhering to the support, constituted essentially by an intimate mixture of 100 parts by weight of crude polyethylene chlorosulphonate rubber with a 3–50 parts by weight of heat-hardenable melamine resin and with a proportion of a vulcanising agent and accelerator required for the vulcanisation of the rubber, the said layer being present in a quantity of 35 to 200 g/m^2;

(B) forming of a pack of:

(a) a core for the laminate,

(b) at least one sheet of melamine impregnated paper or melamine impregnated fabric, heat-hardenable on one face of the core (a),

(c) the said temporary support with the said vulcanisable layer being in contact with the component (b);

(C) pressing of the pack thus formed at 125°–155° C. under a compression pressure of 15–100 Kg/cm^2 for a time sufficient to simultaneously vulcanise the rubber, harden the resin and combine the components (a), (b) and (c) into a monolithic laminated structure; and

(D) removal of the temporary support from the said monolithic structure.

4,145,241

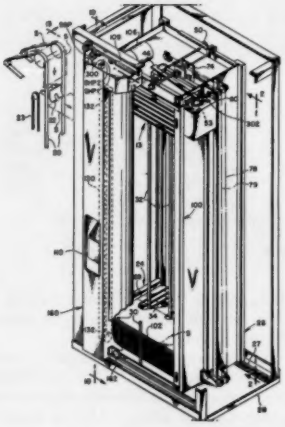
SHEET BINDING METHOD

Donald L. Snellman; John C. Kuspert, both of Seattle, and Arthur G. Saunders, Maple Valley, all of Wash., assignors to Norfin, Inc., Seattle, Wash.

Division of Ser. No. 387,541, Aug. 10, 1973, Pat. No. 4,009,071. This application Jan. 12, 1976, Ser. No. 648,392

Int. Cl.[2] C09J *5/00*; B41L *43/12*; B42B *1/02*

U.S. Cl. 156—305 **11 Claims**



1. A method of binding sheets comprising the steps of feeding the sheets individually into a plurality of spaced sheet receiving compartments, aligning the sheets in at least one of said compartments with one of their edges in a single plane, compressing the coplanar edges of the aligned sheets together, and simultaneously contacting corresponding portions of the compressed sheet edges less than the length thereof with an adhesive bonding agent, thereby binding the compressed sheet edges simultaneously.

4,145,242

WOOD TREATMENT FOR PRESERVING BONDABILITY

Suezone Chow, Vancouver, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jul. 8, 1974, Ser. No. 486,516

Claims priority, application Canada, Jul. 17, 1973, 176593

Int. Cl.[2] C09J *5/04*

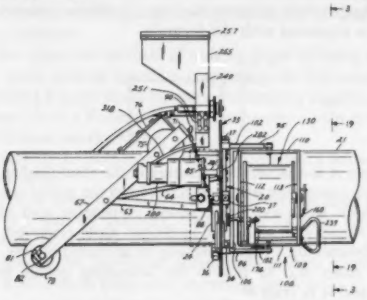
U.S. Cl. 156—316 **6 Claims**

1. A process for preserving the bondability of wood during storing or drying comprising applying to the surface of the wood, prior to said storing or drying, an aqueous solution containing a boron compound selected from the group consisting of borax and boric acid in quantities of up to 1.6 grams solids per square foot.

4,145,243
PIPE WRAPPING COATING APPARATUS

Spencer D. Cottam, Cypress Way, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Filed Nov. 21, 1977, Ser. No. 853,111
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—392 **25 Claims**

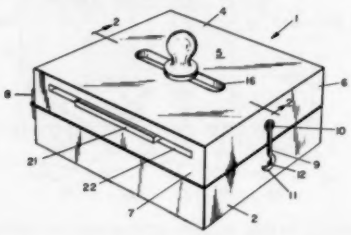


1. Pipe wrapping apparatus, comprising non-rotative ring means disposable coaxially around a pipe to be wrapped, driven ring means supported by said non-rotative ring means for coaxial rotation about the pipe, wheeled support means supporting said non-rotative ring means and having wheels engageable with the pipe for movement of said apparatus along the pipe, at least one spindle support means supported by said driven ring means for rotation about the pipe therewith, a pipe wrapping tape spindle supported by each said spindle support and each said spindle support means being supported for pivotal movement about an axis transverse to the center of the axis of the tape spindle supported thereby, whereby either end of each tape spindle may move closer to the pipe than the other end thereof in order that tape from a tape roll mounted on the tape spindle may be wound helically around the outer surface of the pipe at any selected helical angle, said pivotal support of each said spindle support means providing that each said tape roll will be aligned automatically with the tape being helically wound onto the pipe with uniform tape tension across the width of the tape.

4,145,244
PORTABLE TRANSFER TOY

Leylan V. Covey, 2429 Tremont St., Colorado Springs, Colo. 80907

Filed Jul. 21, 1977, Ser. No. 817,569
Int. Cl.[2] B32B *35/00*
U.S. Cl. 156—541 **7 Claims**

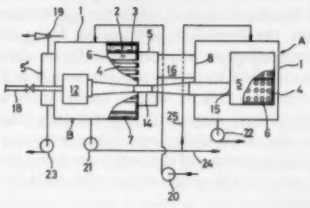


1. A portable transfer toy comprising a casing having a flat base platen member and a slotted cover hinged thereto, quill holder means arranged within said cover and having handle means disposed in the slot thereof, a multiplicity of quill-like flexible fingers depending from said quill holder means, a first sheet of paper having images to be copied being disposed on said base platen member and a second sheet of wax paper superposed thereon, whereby when said cover is closed and said quill holder reciprocated in said slot relative thereto pressure from said fingers is applied to said sheets and images from said first sheet are transferred to said second sheet, after which said first sheet is removed and replaced by a third unmarked sheet of paper and the operation repeated to transfer the images from said second sheet to said third sheet.

4,145,245
DOUBLE-EFFECT EVAPORATOR

Masaharu Takada, Kobe, Japan, assignor to Sasakura Engineering Company, Limited, Osaka, Japan

Filed Apr. 13, 1977, Ser. No. 787,163
Claims priority, application Japan, Apr. 20, 1976, 51-49639[U]
Int. Cl.[2] B01D *1/26, 1/28*
U.S. Cl. 159—13 B **4 Claims**



1. A double-effect evaporator comprising a first effect and a second effect each consisting essentially of

spray means at an upper portion in a casing for spraying feed-liquid,

a bundle of heat-exchange tubes in said casing below said spray means and extending substantially horizontally in an evaporation chamber in said casing between inlet and outlet headers, and

a concentrated liquid collector at the bottom of said casing,

said evaporator further comprising steam ejector means externally of said effects,

said heat-exchange tubes of said first effect extending perpendicularly to the heat-exchange tubes of said second effect,

said ejector means being closely adjacent said second effect and a suction port of said ejector means opening into said evaporation chamber of said second effect while a discharge port of said ejector means opens into said inlet header of said first effect, and

said evaporation chamber of said first effect having an outlet closely adjacent and connected to said inlet header of said second effect, whereby said evaporator is compactly assembled.

4,145,246
PROCESS FOR MAKING HIGH-STRENGTH, HIGH-YIELD SULFITE-MODIFIED THERMOMECHANICAL PULP AND A LINERBOARD COMPOSITION PRODUCED THEREFROM

David W. Gobeen, Camas, and Michael D. Fahey, Vancouver, both of Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Jul. 19, 1976, Ser. No. 706,362
Int. Cl.[2] D21B *1/30*
U.S. Cl. 162—23 **29 Claims**

1. A linerboard composition having a percent mullen of at least 80%, which includes at least 25% by weight of a sulfite-modified thermomechanical pulp having a yield of at least 85% by weight, a percent bound sulfur level of at least about 0.15% by weight, based on the total weight of lignocellulose employed in producing said sulfite-modified pulp.

12. A process for producing a linerboard composition having a percent mullen of at least 80%, including a replacement

quantity of sulfite-modified thermomechanical pulp, which comprises:

(a) initially imparting mechanical attritional forces to undefibered lignocellulose which has been subjected to an elevated temperature and corresponding pressure for a residence time period sufficient to soften the lignin portion of the lignocellulose causing substantial fiber separation to occur in the middle lamella layer so that the fibers remain essentially intact with a lignin coating on their outer surfaces, the power imparted to said undefibered lignocellulose by said initial mechanical attritional forces being sufficient to provide said substantial fiber separation without causing significant disassembly of the cellulose layers which form the fibers themselves;

(b) adding a sulfite chemical to the lignocellulose prior to, during, or subsequent to said initial mechanical attrition step so that a substantial quantity of carbon-to-sulfur covalent bonds are created when the sulfite interacts with the lignin, the degree of sulfonation being controlled in a manner adequate to produce sulfite-modified thermomechanical pulp having a percent bound sulfur level of at least about 0.15% by weight, based on the total weight of lignocellulose employed in producing said sulfite-modified pulp, while at the same time preventing dissipation of the lignin content of the sulfite-modified thermomechanical pulp to the point where the yield is detrimentally affected;

(c) subjecting said sulfite-treated lignocellulose to a second mechanical attrition step, conducted at substantially atmospheric temperature and pressure conditions, to produce a sulfite-modified thermomechanical pulp having a yield of at least about 85% by weight, the average fiber length of the undefiberized lignocellulose being substantially maintained on formation of the sulfite-modified thermomechanical pulp to facilitate the maintenance of a critical bursting strength level;

(d) forming an aqueous linerboard furnish, including at least about 25% by weight of said sulfite-modified thermomechanical pulp, capable of being formed into linerboard having a percent mullen of at least about 80%, without altering the ability of the furnish to properly drain;

(e) depositing said furnish on a foraminous surface to produce a wet linerboard web; and

(f) drying said linerboard web.

4,145,247

COMPOSITION, FOR THE TREATMENT OF PAPER, WHICH CONTAINS HYDANTOIN COMPOUNDS AND AN AMINE CURING AGENT

Sameer H. Eldin, Birsfelden; Wolfgang Seiz, Pfeffingen, and Ewald Forster, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 14, 1977, Ser. No. 806,573

Claims priority, application Switzerland, Jun. 25, 1976, 8158/76

Int. Cl.[2] D21F *11/00*

U.S. Cl. 162—136 **19 Claims**

1. A process to improve the wet strength of paper, comprising the steps of impregnating the paper with an effective amount of components (a) at least one water-soluble hydantoin which contains two or more glycidyl groups and (b) a water-soluble amine curing agent with at least two active amine hydrogen atoms, and curing at room temperature or by heat treatment.

4,145,248

AIR DRYING PROCESS

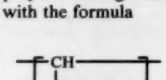
Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 13, 1977, Ser. No. 841,863

Int. Cl.[2] D21D *3/00*; **C07C** *43/00*

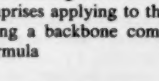
U.S. Cl. 162—168 R **22 Claims**

1. A hydrophilic polymer having a backbone comprising at least two segments with the formula



wherein A is a moiety terminating in the residue of an active hydrogen-containing group selected from the group consisting of alcoholic hydroxyl, thiol, amide, carboxylic acid and secondary amine with an active hydrogen atom removed, E is a moiety containing a radical having an activated olefinic unsaturation either α,β or β,γ to the activating group, m is an integer and is at least 4.

11. A process for enhancing inter-fiber bonding in a fibrous substrate which comprises applying to the substrate a hydrophilic polymer having a backbone comprising at least one segment with the formula



wherein A is a moiety terminating in the residue of an active hydrogen-containing group selected from the group consisting of alcoholic hydroxyl, amide, carboxylic acid and secondary amine with an active hydrogen atom removed, E is a moiety containing a radical having an activated olefinic unsaturation either α,β or β,γ to the activating group, n is the number of adjacent, (as the term is hereinbefore defined), segments in the polymer having this formula, m is an integer, and m and n are at least one provided that where either is less than 4, the other is at least 4; and curing the polymer in the presence of oxygen.

4,145,249

SHEARING MEANS FOR PENETRATING PULP STOCK ON FOURDRINIER MACHINE

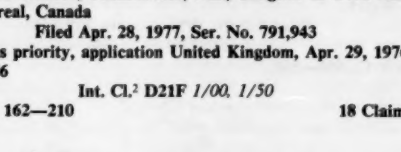
Victor E. Hansen, Jacksonville, Fla., assignor to JWI Ltd., Montreal, Canada

Filed Apr. 28, 1977, Ser. No. 791,943

Claims priority, application United Kingdom, Apr. 29, 1976, 17402/76

Int. Cl.[2] D21F *1/00, 1/50*

U.S. Cl. 162—210 **18 Claims**



1. An improved method of making paper utilizing a Fourdrinier paper making machine, comprising the following steps:

supplying a paper stock having a consistency greater than ½% and less than 2½% to a Fourdrinier fabric whereby a pulp stock web is formed on the fabric;

dewatering the pulp stock web to a consistency between 2% and 5½%;

applying a shearing action to fiber bundles and flocs situated in the web by shearing means at a location where the

consistency of the web is between 2% and 5½%, thereby upsetting the fibers and redistributing them substantially in a horizontal plane and smearing the flocs;

removing additional water from the pulp stock web downstream from the location where the shearing action is applied to the web; and

removing the web from the Fourdrinier fabric and directing the web to pressing and drying sections of the paper making machine.

18. An improved method of making paper utilizing a Fourdrinier paper making machine, comprising the following steps:

supplying a paper stock having a consistency slightly greater than 2% to a Fourdrinier fabric whereby a pulp stock web is formed on the fabric;

dewatering the pulp stock web to a consistency between 2% and 5½%;

applying a shearing action to fiber bundles and flocs situated in the web by shearing means at a location where the consistency of the web is between 2% and 5½%, thereby upsetting the fibers and redistributing them substantially in a horizontal plane and smearing the flocs;

removing additional water from the pulp stock web downstream from the location where the shearing action is applied to the web; and

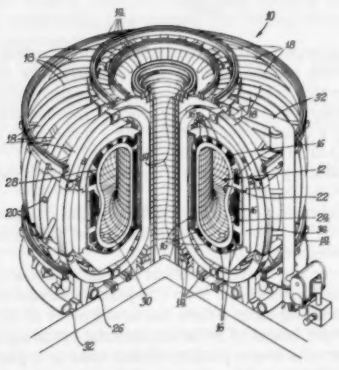
removing the web from the Fourdrinier fabric and directing the web to pressing and drying sections of the paper making machine.

4,145,250

IN SITU REGENERATION OF THE FIRST WALL OF A DEUTERIUM-TRITIUM FUSION DEVICE

Tihiro Ohkawa, La Jolla, and Jack Chin, San Diego, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Feb. 26, 1976, Ser. No. 661,700
Int. Cl.² G21B *1/00*; H01J *9/395*
U.S. Cl. 176—3 **13 Claims**



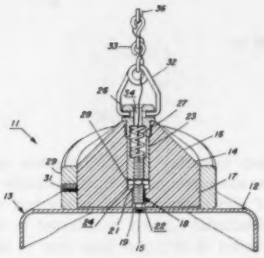
1. A method for regenerating the first wall of a deuterium-tritium fusion device wherein the first wall substantially surrounds an enclosed reaction region confined within a reaction chamber, said method comprising introducing gas into said chamber, at least a portion of said gas comprising material suitable for forming said first wall, depositing at least a portion of said material in solid form on said first wall, removing residual gas from said chamber, and charging said chamber with a mixture of deuterium and tritium, all the while substantially precluding the inflow of contaminants into said chamber.

4,145,251

CORROSION MEASURING APPARATUS FOR RADIOACTIVE COMPONENTS

Frank D. Qurnell, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Jun. 13, 1977, Ser. No. 805,649
Int. Cl.² G21C *17/00*
U.S. Cl. 176—19 R **9 Claims**



1. Apparatus for detecting the thickness of corrosion at selected areas on the surface of a radioactive component submerged in a body of transparent radiation shielding fluid, comprising: a probe including a body formed of transparent material; a transducer within a bore in said body; means for holding said transducer within said bore including means for allowing limited vertical movement of said transducer in said bore with respect to said body, the bottom end of said transducer normally projecting beyond a bottom surface of said body; remote means for manipulating and visually positioning said probe over the surface of said component and for resting said probe on said surface of said component with said transducer contacting a selected local area of said surface by viewing said local area through said body; resilient means for urging said transducer into contact with said local area, said transducer providing a signal proportional to the distance between said transducer and the electrically conductive surface of said component at said local area.

4,145,252

RESPIRATORY SYNCYTIAL VACCINE

Eugene B. Buynak, North Wales, and Maurice R. Hilleman, Lafayette Hill, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 825,520, Aug. 17, 1977, which is a continuation-in-part of Ser. No. 766,995, Feb. 9, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 918,760
Int. Cl.² C12K *7/00*
U.S. Cl. 195—1.3 **6 Claims**

1. A process of preparing an attenuated respiratory syncytial virus comprising serially passaging a respiratory syncytial virus in human dipoid lung fibroblasts at an incubation temperature of from about 30° to about 38° C. for a number of passages effective to attenuate the virus yet retain its antigenicity and immunogenicity, and harvesting the resulting virus.

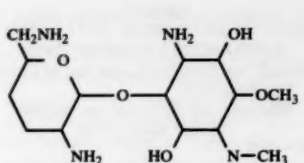
4,145,253

PROCESS FOR PRODUCING FORTIMICIN FACTORS

Takao Iida, Tokyo; Kunikatsu Shirahata; Isao Maisubara, both of Machida; Masahiro Sugimoto; Shinzo Ishii, both of Shizuoka; Ryo Okachi, Macheda, and Takashi Nara, Tokyo, all of Japan, assignors to Abbott Laboratories, Chicago, Ill.

Filed Oct. 27, 1977, Ser. No. 845,970
Claims priority, application Japan, Oct. 28, 1976, 51-128837; Jan. 14, 1977 52-2338
Int. Cl.² C12D *9/14*
U.S. Cl. 195—96 **11 Claims**

1. A process for producing antibiotic compounds of the general structural formula



wherein R is H or

which comprises culturing a microorganism of the species *Micromonospora olivoasterospora* which is capable of producing at least one of said compounds in a nutrient medium until substantial antibacterial activity is detected in the culture liquor and thereafter isolating at least one of said antibiotic compounds therefrom.

4,145,254

RED PIGMENT PRODUCTION

David Shepherd, Morges, and Mariette S. C. Carels, Orbe, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., La Toure de Peilz, Switzerland

Filed May 25, 1977, Ser. No. 800,354

Claims priority, application Switzerland, Jun. 2, 1976, 6919/76

Int. Cl.[2] C12D *13/02*; A23L *1/27*

U.S. Cl. 195—81 **5 Claims**

1. A process for producing an orange Monascus pigment by growing a microorganism of the genus Monascus in an aqueous nutrient medium under aerobic conditions, wherein the microorganism is grown at a pH-value in the range from 4 to 7 in a first medium which promotes its growth; a first biomass is obtained; the first biomass thus obtained is transferred to a second medium which stimulates the production of pigment; the pH is controlled to a value in the range from 2 to 4 which inhibits the reaction of the produced orange pigment with the medium to prevent production of reg pigment; the growth process is continued for a period of 2 to 7 days at a temperature in the range from 20° to 35° C and orange pigment is extracted with a solvent from the second biomass obtained.

4,145,255

METHOD AND DEVICE FOR THE DETECTION OF PHENOL AND RELATED COMPOUNDS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Julian G. Schiller, and Chung C. Liu, both of Pittsburgh, Pa., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 25, 1977, Ser. No. 772,167

Int. Cl.[2] C12B *1/00*; C12K *1/10*

U.S. Cl. 195—103.5 R **11 Claims**

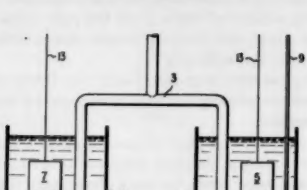
1. An electrochemical cell for the detection of phenol and phenol related compounds which comprises:

a cathode compartment containing a cathode in an electrolyte solution containing ferrocyanide ion;

an anodic compartment containing an anode formed by coating a gel containing a phenol or phenol related compound oxidizing enzyme onto the conductive substrate of said anode immersed into an electrolyte solution containing ferrocyanide ion;

means for directing oxygen into said electrolyte solution in said anodic compartment;

means for maintaining a conductive relationship between anodic and cathodic compartments; and



means connected to said anode and cathode for measuring the potential of the oxidation of said phenol or phenol related compound.

4,145,256

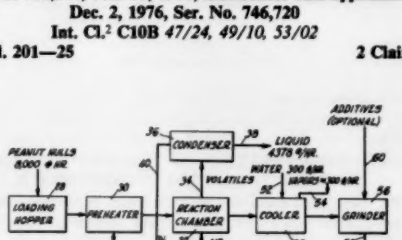
METHOD AND APPARATUS FOR PRODUCING A CARBONACEOUS RESIDUE PRODUCT

Mack D. Bowen, Smyrna, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Continuation of Ser. No. 82,602, Oct. 21, 1970, abandoned, and a continuation of Ser. No. 575,794, May 8, 1975, abandoned, and Ser. No. 701,248, Jun. 30, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 746,720

Int. Cl.[2] C10B *47/24, 49/10, 53/02*

U.S. Cl. 201—25 **2 Claims**



1. In a process for the production of a high-carbon content carbonaceous residue product from a particulate cellulosic material, which material decomposes at elevated temperatures in an exothermic reaction, to produce a gaseous component containing a condensable fraction, and a less-readily oxidized solid component, the steps comprising:

(a) introducing such cellulosic material into the upper end of a vertical reaction zone;

(b) substantially continuously effecting the descent of said material, as a non-fluidized moving bed, within said zone and outwardly therefrom;

(c) heating said material to effect its thermal decomposition, into said gaseous and solid components, in said zone;

(d) introducing air at a flow rate in the order of 0.25 cu. ft. of air per pound of cellulosic material introduced in step (a) into the lower portion of said zone at a plurality of vertically-spaced locations partially to oxidize said gaseous component and raise the temperatures in said bed, and passing the resultant gas upwardly therethrough; and

(e) controlling both the rate of descent of said bed through said zone and said flow rate of said air introduced thereinto, to:

(1) sustain said thermal decomposition of said material, while avoiding complete oxidation of said gaseous component,

(2) establish an upwardly decreasing vertical temperature gradient in said bed,

(3) effect condensation of at least part of said condensable fraction upon said material near said upper end of said zone, and

(4) effect substantially complete devolatilization of said solid component, so as to produce a substantially dry, devolatized carbonaceous residue product having an elemental carbon content in excess of about ninety percent by weight thereof and a surface area in excess of about 100 sq. meters per gram.

4,145,257

DISCHARGE APPARATUS FOR INCLINED COKE OVENS

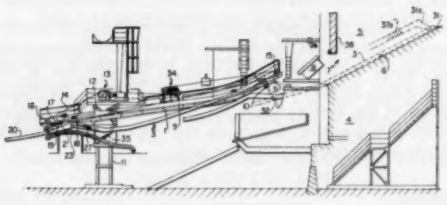
Heinz-Günther Grewe, Höxter; Horst Seeberg, Essen; Horst Fach, Essen, and Friedrich Isermann, Essen, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,928

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633331

Int. Cl.[2] C10B *33/00, 33/08, 43/04*

U.S. Cl. 202—241 **36 Claims**



1. A device for discharging, detaching and/or loosening coke within a coke oven chamber of the type having an inclined floor, opposite side walls, a front wall having a coke removal opening therein, the coke removal opening being at the bottom of a coke oven chamber, and a chamber door pivotably hinged to said front wall and pivotable upwardly and outwardly from a position closing said opening to selected positions uncovering said opening by varying amounts, said device comprising:

a track support adapted to be mounted at a position confronting an opening of a coke oven chamber;

an elongated poking bar supported by said track support such that a first end of said poking bar is adapted to be positioned adjacent a coke oven chamber, said poking bar first end having head means for abutting or scraping coke;

means, mounted on said track support, for moving said poking bar from an initial position outside of a coke oven chamber to an operative position whereat said head means is within a coke oven chamber, and for returning said poking bar to said initial position;

guide means associated with said track support for guiding the path of displacement of said poking bar, during a portion of the movement thereof from said initial position in a direction toward said operative position, to follow a predetermined curved course necessary to avoid obstructions located outside a coke oven chamber, to pass said head means through the removal opening of a coke oven chamber and to position said head means on the floor of a coke oven chamber, and for guiding said poking bar during the return movement thereof to follow said predetermined course; and

said head means being arranged and constructed to slide on the floor of a coke oven chamber and thereby guide said poking bar during the remaining portion of movement thereof to and from said operative position thereof.

4,145,258

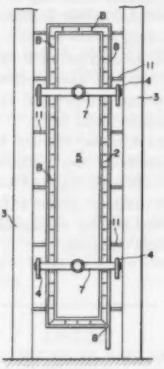
APPARATUS FOR PREVENTING GAS LEAKAGE FROM OVEN DOOR OF COKE OVEN

Koretoshi Fujishiro, and Masamitsu Hiyoshi, both of Kagawa, Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,297

Int. Cl.[2] C10B *25/18*

U.S. Cl. 202—248 **5 Claims**



1. In a coke oven of the type comprising a door frame defining an oven opening, an oven door for closing the oven opening, and a knife-edge surrounding the oven door for forming a seal line to the door frame for preventing leakage of oven gas, the improvement which comprises a conduit arranged along the outside periphery of said oven opening and provided with a plurality of cooling gas ejection nozzles at least along one side, the top side, and the other side of said oven opening, and means for supplying compressed cooling gas to said conduit, said cooling gas ejection nozzles being directed such that cooling gas is blasted inwardly towards said seal line between said knife-edge and said door frame when said door is closed, whereby said seal line is cooled and gas leakage therethrough is reduced.

4,145,259

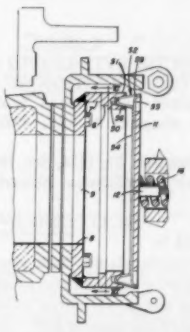
CLOSURE MEMBERS

Hans E. Leumann, Washington, Pa., assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Jun. 9, 1977, Ser. No. 804,909

Int. Cl.[2] B65D *45/28, 53/10;* **C10B** *25/16*

U.S. Cl. 202—248 **13 Claims**



1. In a coke oven having at least one opening therein and a closure for said opening, said closure and said opening having

mating surfaces associated therewith for removably sealing said opening, the improvement comprising:

one of said surfaces having a lip extending from its periphery and a flexible metal sealing surface on said lip;

said flexible metal sealing surface including a pair of hook-shaped projections with one of said hook-shaped projections enveloping a portion of the other of said hook-shaped projections;

the other of said mating surfaces having an extension at its periphery, said extension having an inflexible metal seating groove for receiving said flexible metal sealing surface to seal said opening;

the mating surface associated with said opening being located remote from the line of discharge through said opening, said seating groove and said lip sealing surface providing a metal to metal seal;

hinge means attached to said closure, mounting said closure adjacent said opening, and permitting said closure to move relative to said opening; and locking means attached to said closure to engage means adjacent said opening to move said lip into sealing engagement with said seating groove to seal said opening.

4,145,260

PROCESS FOR DRYING WATER-WET METHYL CHLORIDE

John M. Steele, Lake Jackson; Guillermo J. Nino, Houston, and Fredric M. Hanak, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 8, 1974, Ser. No. 486,539

Int. Cl.[2] B01D *3/36*

U.S. Cl. 203—14 **6 Claims**

1. A method for drying water-wet methyl chloride which comprises distilling the water-wet methyl chloride in the presence of at least 10 molar % hydrogen chloride based on the total weight of acid, water and methyl chloride, as the sole dehydrating agent, under a superatmospheric pressure and a reflux ratio of from about 1.3 to about 4 and a temperature of from about 100° C. to about the azeotrope boiling point under the pressure of said distillation thereby to produce a bottoms from said distillation of not more than about 36% aqueous hydrochloric acid and an overhead of methyl chloride and hydrogen chloride containing less than about 400 molar ppm water.

4,145,261

ELECTROLYTE-LIQUID FOR THE ELECTRODEPOSITION OF ALUMINUM

Theo E. G. Daenen, and Steven A. Stolk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,575

Claims priority, application Netherlands, Feb. 25, 1977, 7702018

Int. Cl.[2] C25D *3/44*

U.S. Cl. 204—14 N **4 Claims**

1. A non-aqueous plating bath comprising a solution of anhydrous aluminum chloride and an alkali metal hydride in a mixture of a first anhydrous aprotic solvent having a flashpoint over 40° C. and of the formula $RO-(CH_2)_m-O-(CH_2)_n OR'$ wherein m and n are integers between 1 and 6 inclusive and R and R' are each alkyl and a second anhydrous aprotic solvent.

4,145,262

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE MANUFACTURED ACCORDING TO THE METHOD

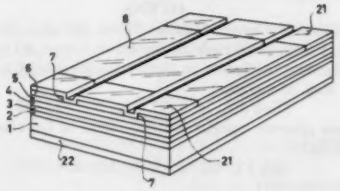
Rudolf P. Tijburg, and Teunis van Dongen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 771,697, Feb. 24, 1977, abandoned. This application Mar. 17, 1978, Ser. No. 887,647

Claims priority, application Netherlands, Feb. 27, 1976, 7602014

Int. Cl.[2] C25D *9/00, 9/06, 11/32*

U.S. Cl. 204—15 **6 Claims**



1. A method of manufacturing a semiconductor device for generating laser beams, the device comprising a semiconductor body having mirror faces transverse to the direction of the beams which reflect the beams and transverse to the major surfaces of the device, which method comprises the step of subjecting said mirror faces to an oxidation treatment which includes an electrolytic oxidation step.

4,145,263

STEEL SHEET USEFUL IN FORMING FOODSTUFF AND BEVERAGE CANS

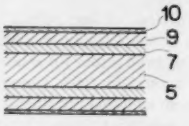
Nobuyuki Tsutsui, Kudamatsu; Tsuneo Inui, Tokuyama, and Hiroaki Kawamura, Kudamatsu, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1977, Ser. No. 824,304

Claims priority, application Japan, Aug. 25, 1976, 51/100501

Int. Cl.[2] C25D *11/38, 5/48*

U.S. Cl. 204—35 R **6 Claims**



1. A process for producing a steel sheet containing a first layer of tin and a second layer of hydrated chromium oxide, which consists essentially of electrolytically tin plating a substantially clean steel sheet base in an electrolyte containing stannous sulfate, stannous chloride, stannous fluoborate, sodium stannate or potassium stannate, to obtain a tin plated steel sheet in which the amount of plated tin is 0.05–0.60 g/m^2, subjecting the resultant steel sheet to an electrolytic treatment at 5–20 coulombs/dm^2 under 5–50 A/dm^2 of current density in an electrolyte containing chromic acid and at least one member selected from the group consisting of sulfuric acid, a fluorine compound, an aromatic disulfonic acid and thiourea, to form a second layer consisting essentially of hydrated chromium oxide in an amount of 0.005 to 0.05 g/m^2 calculated as chromium, any metallic chromium deposited between said first and second layers being present in an amount less than 0.005 g/m^2.

4,145,264

PREPARATION OF METAL-FREE PHTHALOCYANINES

Peter Thoma, Frankenthal; Wolfgang Habermann, Mainz, and Joachim Kranz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rhineland-Pfalz, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 884,892

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1977, 2711005

Int. Cl.[2] C25B *3/04;* C07D *207/00;* C09B *47/04*

U.S. Cl. 204—59 R 19 Claims

1. A process for the preparation of a metal-free phthalocyanine, wherein a solution or suspension of one or more aromatic o-dinitriles in a organic liquid is electrolyzed in the presence of hydrogen or of a compound which eliminates hydrogen under the reaction conditions, and in the presence of one or more alkaline compounds as activators, using electrodes which are inert under the reaction conditions, the hydrogen overvoltage at the cathode not exceeding 1,500 mV (measured against a reversible hydrogen electrode in a medium of the same composition as the reaction mixture) and the organic liquid containing small amounts of one or more dissolved electrolytically conductive compounds.

4,145,265

PROCESS FOR CONCENTRATION OF CAUSTIC ALKALI SOLUTION PRODUCED BY ION EXCHANGE MEMBRANE TYPE ELECTROLYSIS

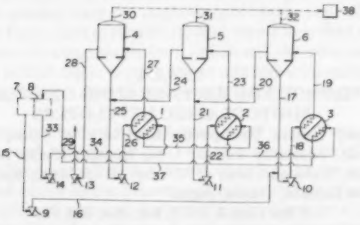
Jyoichi Nakata, Tokyo; Yasumasa Chiba, Ichikawa; Tetsuhiko Seto, and Yoshinori Fukuhara, both of Kure, all of Japan, assignors to Asahi Glass Company, Ltd. and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,387

Claims priority, application Japan, Mar. 15, 1977, 52-28388

Int. Cl.[2] C25B *1/16, 1/26*

U.S. Cl. 204—98 10 Claims



1. In a process for producing a concentrated aqueous caustic alkali solution by:

(a) electrolyzing an aqueous solution of an alkali metal chloride in an electrolysis cell divided by a membrane into an anode compartment and a cathode compartment, whereby a dilute aqueous caustic alkali solution is generated in said cathode compartment and a dilute alkali metal chloride solution which has been heated by the passage of electric current is generated in said anode compartment, and

(b) removing said dilute aqueous caustic solution from said cathode compartment and concentrating it by evaporation of water therefrom, the improvement comprising:

subjecting said dilute caustic alkali solution to a plurality of concentrating operations each comprising the steps of

heating said dilute caustic alkali solution by heat exchange with said electrically heated dilute alkali metal chloride solution and

removing water vapor from said heated dilute caustic alkali solution, whereby an enriched caustic alkali solution is produced,

wherein said dilute alkali metal chloride solution and said caustic alkali solution are passed countercurrently through the heat exchange steps of said concentrating operations and said dilute alkali metal chloride solution is recycled to the anode compartment of said electrolysis cell.

4,145,266

SIMULATED LEATHER MATERIALS AND ELECTROLYTIC PROCESS FOR MAKING THEM

Kuniyuki Hayasaka, and Yutaka Tamaoka, both of Akashi, Japan, assignors to Honny Chemicals Co., Ltd., Kobe, Japan

Continuation-in-part of Ser. No. 862,526, Dec. 20, 1977. This application Feb. 2, 1978, Ser. No. 874,531

Claims priority, application Japan, Dec. 21, 1976, 51-152921; Feb. 4, 1977, 52-10719; Feb. 4, 1977, 52-10720

Int. Cl.[2] C25D *9/02*

U.S. Cl. 204—131 17 Claims

1. A simulated leather made by the application of a finishing surface treatment to a structure having a microporous surface film obtained by applying a film-forming dope containing a film-forming polymer and a solvent together with an ionizable organic compound on a support and passing said support through a coagulation bath between electrodes under the application of an electric current, said finishing surface treatment comprising application of a polymeric top coating or abrasion to said surface.

4,145,267

NONPLATING CATHODE AND METHOD FOR PRODUCING SAME

Richard A. Bird, and Lowell W. Austin, both of Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Sep. 6, 1977, Ser. No. 830,834

Int. Cl.[2] C25F *5/00;* C25D *5/48, 5/02*

U.S. Cl. 204—140 21 Claims

1. A method of producing a cathode which is immune to plating a zinc coating on its surface in an electrolytic galvanizing process, comprising:

(a) immersing a cathode in a zinc ion containing electrolytic bath,

(b) electrolytically causing a zinc coating to form on the surface of the cathode, and

(c) electrolytically or chemically removing said zinc coating from the cathode.

4,145,268

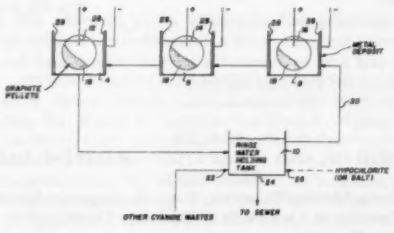
METHOD OF CONDUCTING AN ELECTROLYSIS

Klaus H. Oehr, Surrey, Canada, assignor to British Columbia Research Council, Vancouver, Canada

Filed Mar. 22, 1977, Ser. No. 779,976

Int. Cl.[2] C02B *1/82*

U.S. Cl. 204—149 18 Claims



1. A method of destroying cyanide in cyanide containing waste liquor comprising tumbling an anode comprising a plurality of electrically conducting particles in the liquor while feeding a positive direct current to the particles via an anode feeder connected to a positive direct current source;

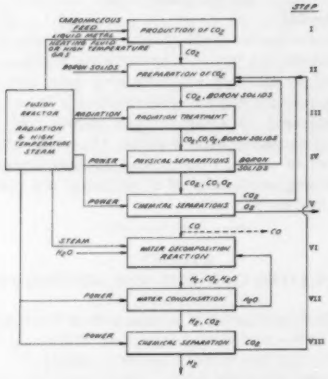
maintaining a cathode in electrical contact with the liquid,

said cathode being spaced from the anode, and applying a negative direct current to the cathode, whereby the cyanide present is anodically oxidized.

4,145,269
MULTI-STEP CHEMICAL AND RADIATION PROCESS FOR THE PRODUCTION OF GAS

Robert J. Teitel, Ann Arbor, Mich., assignor to Texas Gas Transmission Corporation, Owensboro, Ky.

Continuation-in-part of Ser. No. 416,999, Nov. 19, 1973, abandoned. This application May 3, 1976, Ser. No. 682,673
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 H **7 Claims**



1. An improved process of utilizing radiation and heat from a fusion reaction taking place in a central chamber to derive a desired chemical product from an expendible material which gives a low yield of the desired product when exposed to said radiation, which comprises:

(a) selecting a first feed material different from said expendible material which feed material has a high G value that upon exposure to said radiation forms a chemically active part and by-product;

(b) selecting said expendible material as a second feed material having a separable part containing the desired product and a second separable part reactable with the chemically active part to replace the by-product of the first feed material;

(c) confining said first feed material in a separate container from the central chamber located to receive neutron radiation from said fusion reactor and thereby subjecting it to a high density neutron radiation from said reaction in a radiolytic reaction to liberate said chemically active part; and

(d) combining said chemically active molecule with said second feed material in a thermochemical reaction fueled by said heat to liberate the desired product and thereby reform the first feed material.

4,145,270
METHOD OF, AND APPARATUS FOR DRYING DAMP BASEMENTS

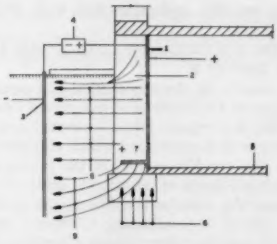
Dinu-Stefan Moraru, Bucharest, Romania, assignor to Institutul de Cercetari in Constructii Si Economia Constructiilor, Bucharest, Romania

Filed May 23, 1977, Ser. No. 799,766
Int. Cl.² B01D *13/02*
U.S. Cl. 204—180 R **10 Claims**

1. A method of drying damp basements by electroosmosis comprising the steps of:

applying an electrically conductive non-metallic plaster to the inner surface of the walls of said basement to form a first electrode;

boring a plurality of openings in the inner surface of said walls just above floor level and filling said openings with said plaster to form an extension of said first electrode;



placing a plurality of electrically conductive non-metallic grounds in the earth around said walls of said basement to form a second electrode;

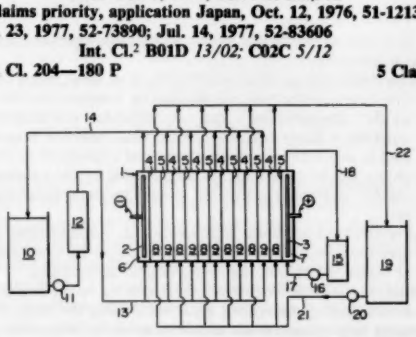
applying a positive voltage from a D.C. power supply to said first electrode; and

applying a negative voltage from said D.C. power supply to said second electrodes.

4,145,271
METHOD FOR REGENERATING OXIDIZED PHOTOGRAPHIC DEVELOPERS

Yoshinori Nosse; Tomoyoshi Ono, both of Hino; Hideaki Suzuki, Machida; Takezo Ono, Kodaira; Seiki Iribe, and Mineo Watanabe, both of Mihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 3, 1977, Ser. No. 838,971
Claims priority, application Japan, Oct. 12, 1976, 51-121324; Jun. 23, 1977, 52-73890; Jul. 14, 1977, 52-83606
Int. Cl.² B01D *13/02*; C02C *5/12*
U.S. Cl. 204—180 P **5 Claims**



1. A method for regenerating an oxidized photographic developer, which comprises subjecting the oxidized developer to a contacting treatment with an adsorbent material which has affinity for the oxidation product of the developing agent or its derivatives and is substantially insoluble in the developer, and to an electrodialysis treatment using ion exchange membranes.

4,145,272

OXYGEN SENSOR

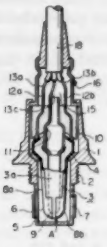
Koyo Nakamura, Yokosuka; Masayasu Nakajima, Yokohama, and Akihiro Ohnishi, Koshigaya, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 22, 1977, Ser. No. 826,547

Claims priority, application Japan, Aug. 23, 1976, 51-112761[U]

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 S **2 Claims**



1. In a single oxygen sensor unit for an internal combustion engine equipped with an electronic closed loop feed back control system for controlling the ratio of an air fuel mixture fed to the combustion chambers of said internal combustion engine, said sensor unit being directly disposable through the wall of an exhaust conduit of said internal combustion engine with one end thereof directly exposed to the flow of exhaust gases flowing therein and being provided with three electrical terminals, each of said terminals being electrically isolated from each other and said exhaust conduit and each being individually connected to said closed loop control system for supplying thereto two distinct signals, each of said signals being representative of a concentration of oxygen in the exhaust gases passing over the single oxygen sensor unit, one of said signals being used to recalibrate said closed loop feed back control system to compensate for a variation in the other signal with aging of said single oxygen sensor unit and with variation of the temperature thereof, said single oxygen sensor unit including:

an elongate cylindrical casing having a cap portion at a first end thereof, a thread portion formed in the exterior of said casing between said first end and a second end for securing said sensor in the exhaust conduit, said casing having a plurality of openings formed therein near said second end to permit the passage of said exhaust gases through and into said casing;

an elongate body of solid electrolyte which has a generally tapered cylindrical shape with a smoothly rounded nose portion, said body of solid electrolyte being formed with a blind stepped bore therein, said blind bore terminating near said nose portion, the surface of said blind bore defining a first surface and the outer surface of said body of solid electrolyte defining a second surface, said blind bore being oriented to direct the open end of said blind bore toward said first end of said casing and be fluidly communicated with the ambient atmosphere through holes formed in said cap portion;

a first electrode made of platinum formed in said first surface to act as a reference electrode;

a first annular support member disposed between said casing and said body of solid electrolyte so as to hermetically divide said casing into first and second chambers, said first chamber being located between said first annular support member and said first end of said casing and said second chamber being located between said first annular support member and said second end of said casing, said second chamber being fluidly communicated with said exhaust conduit through said plurality of openings;

a cylindrical connector, a portion of which is received in said blind bore to be in electrical contact with said first electrode; and

a second annular support member disposed in said casing to receive a portion of said cylindrical connector in the circular opening formed therein;

the improvement comprising:

two lead lines passing through said second annular support member and being pressed against said second surface by pressure applied thereto by said cap portion, the ends of said two lead wires and said cylindrical connector which extends toward said first end of said casing defining said three terminals;

a second electrode made of platinum formed on said second surface in a manner to be in electrical contact with one of said two lead lines, to cover a portion of said second surface and extend longitudinally along said second surface from said nose portion in the direction of said first end of said casing;

a third electrode made of a metal selected from the group of gold and platinum poisoned with a suitable poison so as to be devoid of catalytic properties, said third electrode being formed on said second surface in a manner to be in electrical contact with the other of said two lead lines, cover a portion of said second surface, extend along said second surface from said nose portion in the direction of said first end of said casing and be electrically isolated from said second electrode;

said second and third electrodes in said second chamber being diametrically oppositely positioned relative to each other on said second surface such that exhaust gases entering said second chamber are caused to simultaneously contact the closely juxtaposed second and third electrodes.

4,145,273

TRANSFORMER OIL PROCESSING

Theodore C. Mead, Port Neches; Avilino Sequeira, Jr., Port Arthur, and Norman R. Odell, Nederland, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,335

Int. Cl.[2] C10G *27/00, 34/00*

U.S. Cl. 208—3 **9 Claims**

1. A method of making transformer oils comprising

(a) contacting a naphthenic oil with an oxygen-containing gas in the presence of a catalyst comprising an alkali or alkaline earth metal salt of permanganate at a temperature below 275° F. and a pressure ranging up to about 300 psi,

(b) washing the oxidized oil from (a) with an aqueous solution of a base,

(c) contacting the washed oil from (b) with hydrogen in two stages in the presence of a hydrogenation catalyst at a temperature from about 400° to 675° F. at a pressure from about 15 to 400 psi at a space velocity ranging from 0.1 to 10.0 vol/vol/hr at a hydrogen dosage between about 50 and 500 scfb.

4,145,274

PYROLYSIS WITH STAGED RECOVERY

Norman W. Green, Upland, Calif.; Kandaswamy Duraiswamy, Sterling, Va.; Robert E. Lumpkin, and Bruce L. Winter, both of Claremont, Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 699,991, Jun. 25, 1976, abandoned. This application May 5, 1977, Ser. No. 794,136

Int. Cl.[2] C10G *1/00*; C10B *49/16, 55/08*

U.S. Cl. 208—8 **44 Claims**

1. A continuous process for recovery of values contained in solid carbonaceous materials which comprises the steps of:

(a) providing a feed stream containing a particulate solid carbonaceous material, a substantial portion of the particulate solid carbonaceous material being of a particle size less than about 1000 microns in diameter;

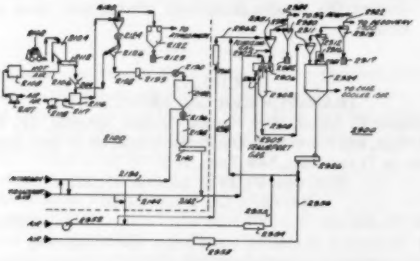
(b) subjecting the solid carbonaceous material particles to flash pyrolysis by continuously:

(i) transporting the solid carbonaceous material containing feed stream contained in a carrier gas which is substantially nondeleteriously reactive with respect to products of pyrolysis of the solid carbonaceous material to a solids feed inlet of a substantially vertically oriented, descending flow pyrolysis reactor having a substantially vertically oriented pyrolysis zone operated at a pyrolysis temperature above about 600° F.;

(ii) feeding a particulate source of heat at a required temperature above the pyrolysis temperature to a substantially vertically oriented chamber surrounding the upper portion of the pyrolysis reactor, the chamber having an inner peripheral wall forming an overflow weir to a vertically oriented mixing section of the vertically oriented descending flow pyrolysis reactor, the particulate heat source in said chamber being maintained in a fluidized state by the flow therewith of an aerating gas substantially nondeleteriously reactive with respect to products of pyrolysis of the solid carbonaceous material;

(iii) discharging the particulate source of heat over said weir and downwardly into said mixing region at a rate sufficient to maintain said pyrolysis zone at the pyrolysis temperature;

(iv) injecting the solid carbonaceous material feed stream and carrier gas from the solids feed inlet into the mixing region to form a resultant turbulent mixture of the



particulate source of heat, the solid carbonaceous material particles and carrier gas;

(v) passing the resultant turbulent mixture downwardly from said mixing zone to the pyrolysis zone of said pyrolysis reactor to pyrolyze the solid carbonaceous material particles and yield a pyrolysis product stream containing as particulate solids, the particulate source of heat and a carbon containing solid residue of pyrolysis of the solid carbonaceous material particles, and a vapor mixture of carrier gas and pyrolytic vapors comprising volatilized hydrocarbons and tars;

(c) passing the pyrolysis product stream from said pyrolysis reactor to a separation zone to separate at least the bulk of the particulate solids from the vapor mixture;

(d) forming the particulate source of heat by:

(i) transporting the separated solids from the separation zone to a cyclone oxidation-separation zone with a transport gas containing free oxygen with resultant carbon monoxide formation from the carbon in the solids; and

(ii) combining the transported particulate solids, carbon monoxide and transport gas in the cyclone oxidation-separation zone with a source of free oxygen in an amount at least equal to 50 mole percent of the carbon monoxide entering the cyclone oxidation-separation zone, the total free oxygen in the transport gas and combined in the cyclone oxidation-separation zone being sufficient to raise the solids to the temperature required for feed to the substantially vertically oriented chamber,

while simultaneously separating the bulk of the particulate source of heat from the gases present in the cyclone oxidation-separation zone to form the feed to the substantially vertically oriented chamber; and

(e) recovering hydrocarbon values from the vapor by progressively cooling the vapor mixture in a plurality of gas-liquid cooling-condensation stages in series, each stage having a liquid coolant, a vapor feed, a vapor effluent, and liquid condensate, the liquid coolant of each stage including condensate of the stage, the liquid coolant of each stage being below the temperature of the vapor feed to the stage and vapor effluent of the stage, the condensate of each stage being progressively lower in average boiling point and tar content.

4,145,275

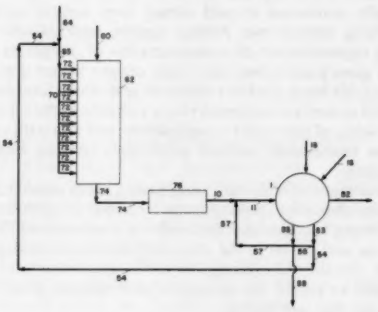
DILCHILL DEWAXING USING WASH FILTRATE SOLVENT DILUTION

Ralph R. Hall, Morristown, N.J., and David H. Shaw, Sarnia, Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 646,006, Jan. 2, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 813,174

Int. Cl.[2] C10G *43/08*

U.S. Cl. 208—33 **8 Claims**



1. In a solvent dewaxing process wherein a waxy petroleum oil stock is at least partially solvent dewaxed in a dilution chilling dewaxing zone by introducing cold dewaxing solvent into said zone to produce a slurry comprising solid wax particles and a dewaxed oil containing solvent and wherein said slurry is passed from said zone to a first filter stage to separate the wax from the dewaxed oil thereby forming a wax cake and an oily filtrate and wherein the wax cake is solvent washed in said stage thereby forming a wash filtrate containing from about 2 to 20 LV% oil, the improvement which comprises (a) recycling a substantial portion of the oil-containing wash filtrate from said first filter stage directly back to the dewaxing zone where it is mixed with fresh dewaxing solvent prior to entering said dewaxing zone as part of the mixed dewaxing solvent entering said dilution chilling dewaxing zone in an amount such that the oil content of the mixed dewaxing solvent entering said zone is less than about 9 LV% and (b) combining the rest of the wash filtrate with the oily filtrate and recycling a portion of the combined filtrate back to the first filter stage wherein it enters said stage with slurry from said dewaxing zone.

4,145,276

PROCESS FOR THE 3-STEP CATALYTIC TREATMENT OF HIGHLY UNSATURATED HEAVY FRACTIONS UNDER HYDROGEN PRESSURE

Jean Cosyns, Maule, and Jean-Pierre Franck, Bougival, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 20, 1977, Ser. No. 862,324
Claims priority, application France, Jan. 5, 1976, 76 00202
Int. Cl.[2] C10G 23/04
U.S. Cl. 208—57 14 Claims

1. A process for the substantially complete hydrogenation of an unstable hydrocarbon fraction obtained by pyrolysis, whose boiling range is at least in major part over 200° C. and which comprises more than 80% b.w. of aromatic hydrocarbons and more than 0.01% b.w. of sulfur, which comprises the successive steps of:

(a) passing the unstable hydrocarbon fraction with hydrogen in contact with a catalyst comprising a group VIII metal in the metal state at a temperature of 100° to 250° C.;

(b) treating the product of step (a) with hydrogen in contact with a catalyst comprising at least one tungsten compound and at least one nickel compound, at a temperature of 250° to 400° C.;

(c) treating the product of step (b) with hydrogen at 200°–380° C. in contact with a catalyst consisting essentially of 0.1–2% b.w. of at least one group VIII noble metal, 0.5–15% b.w. of chlorine or fluorine and alumina, and collecting a hydrogenated and stabilized hydrocarbon fraction.

4,145,277

DENITRIFICATION BY FURFURAL-FERRIC CHLORIDE EXTRACTION OF A HYDRODESULFURIZED HYDROCARBONACEOUS OIL

Stephen J. Miller, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 7, 1978, Ser. No. 913,407
Int. Cl.[2] C10G 21/16, 23/00
U.S. Cl. 208—212 9 Claims

1. In a process for upgrading a hydrocarbonaceous oil wherein said oil is hydrodesulfurized under hydrocarbon hydrodesulfurizing conditions, thereby producing a sulfur-reduced oil contaminated by residual nitrogen-containing impurities, calculated as nitrogen, in an amount in the range of from about 10 to 1000 ppmw, the improvement comprising:

(1) upgrading at least a fraction of said sulfur-reduced oil by contacting said fraction with a solution of ferric chloride, said contacting being under liquid-liquid extracting conditions, including (a) a temperature in the range of from about 0° to 50° C. and (b) a solution-to-oil volume ratio in the range of from about 0.1 to 5, said solution comprising (i) at least a major portion of furfural solvent and (ii) said ferric chloride in an amount by weight, based upon the solution, in the range of from about 0.001 to 10 percent, thereby forming a raffinate oil phase containing a minor portion of said nitrogenous impurity; and

(2) withdrawing said raffinate oil phase from step (1).

4,145,278

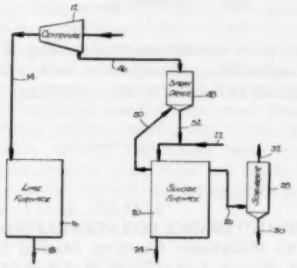
METHOD AND APPARATUS FOR SEWAGE TREATMENT PLANTS

Thomas E. Davy, Westfield, N.J., assignor to Nichols Engineering & Research Corporation, Belle Mead, N.J.

Continuation-in-part of Ser. No. 609,715, Sep. 2, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,193
Int. Cl.[2] C02C 1/24, 3/00
U.S. Cl. 210—10 6 Claims

3. A sewage treatment system including a plurality of sludge treatment stations including settling means comprising means including a sludge furnace feed line for delivering sludge from at least one of said settling means to a sludge furnace, a centrifuge, an inlet in said centrifuge for admitting lime mud therein into precipitated by lime in another of said settling means, a first outlet from said centrifuge, a lime furnace, means connecting said first outlet and said lime furnace for discharging regenerable lime sludge from said centrifuge into said lime furnace, a second outlet for discharging a centrate stream of non-regenerable sludge from said centrifuge, a spray dryer having a centrate inlet, a hot gas inlet and an outlet, outlet means in said sludge furnace for conveying hot exhaust gas from said sludge furnace to said spray dryer via its hot gas inlet, means for conveying said centrate stream from said second outlet in said centrifuge into said spray dryer via its centrate inlet for contact with said hot exhaust gases from said sludge furnace whereby said centrate stream is dried by said hot gases, and means for conveying a centrate stream discharged from the spray dryer outlet to said sludge furnace feed line.

6. In a sewage treatment system including a plurality of



settling stations including settling tanks at least one of which produces a lime mud underflow and from at least one of which sludge is delivered to a sludge furnace, the process comprising passing the underflow lime mud precipitated by lime from at least one of said settling stations into a centrifuge, discharging from said centrifuge, a first stream containing solids, the major constituent of which is calcium carbonate, passing said first stream to a lime furance, passing a second stream from said centrifuge containing materials unsuitable for regeneration into lime to a wet scrubber associated with said sludge furnace, and using said second stream as the scrubbing liquid in said scrubber, and thence passing said second stream from said scrubber into a spray-type dryer while simultaneously passing a portion of the hot exhaust gases and vapors from said sludge furnace to said dryer to dry said second stream, and passing the dried second stream containing solids from the spray dryer to a sludge feed line to said sludge furnace for burning.

4,145,279

WATER RECYCLING SYSTEM

Howard W. Selby, III, Boulder, Colo., assignor to Pure Cycle Corporation, Boulder, Colo.

Filed Jan. 24, 1977, Ser. No. 762,103
Int. Cl.[2] C02B 1/40; C02C 1/04, 1/18
U.S. Cl. 210—17 13 Claims

8. The method of processing waste-water into potable water comprising:

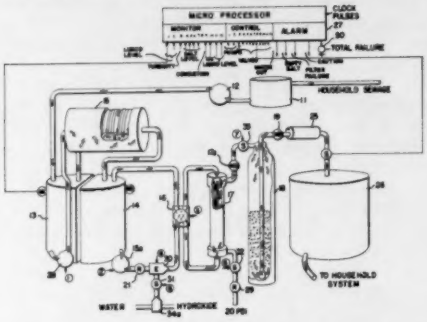
biologically digesting sewage in said waste-water,

filtering virus, bacteria and organic molecules from said waste-water,

intermittently passing said waste-water through ion exchange resins to remove organic materials, color, and inorganic salts,

monitoring the requirement for backflushing of the filter and

conductivity of water passing through said ion exchange resins, and



controlling the intermittent back-flushing of said filter and the regeneration of said resins with a microprocessor connected to respond to said monitoring.

4,145,280

METHOD AND DEVICE FOR SEPARATING A MIXTURE

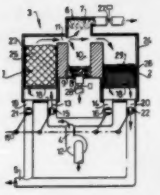
Cornelis G. Middelbeek, Nootdorp; Machiel E. Polano, and Tjako A. Wolters, both of Zeist, all of Netherlands, assignors to Ballast-Nedam Groep N.V., Amstelveen and Skimovex B.V., The Hague, both of, Netherlands

Filed Oct. 14, 1977, Ser. No. 842,241

Claims priority, application Netherlands, Oct. 14, 1976, 7611378; Feb. 4, 1977, 7701232; Feb. 4, 1977, 7701233

Int. Cl.[2] B01D *15/04, 21/10, 29/08, 47/06*

U.S. Cl. 210—20 **23 Claims**



1. A method of separating a mixture of a carrier medium and at least one substance insoluble therein, for example, water and oil or gas and soot, in which a stream of mixture for being filtered is passing through a packet of compact filter material, after which the substance retained in the filter material is removed therefrom by passing the mixture through said packet of filter material, so that this filter material is brought into a moving state, said mixture together with the substance removed from the filter material being conducted along a collecting space and across a compact packet of filter material, characterized in that a stream of mixture to be separated is dissociated in three steps i.e. a first step in which the stream of mixture is passed for coalescence or coagulation of the substance through a packet of moving filter material, a second step in which the stream of mixture is passed along the collecting space and the substance coalesced or coagulated in the first step segregates from the mixture by gravity, and a third step in which the stream of mixture treated in the preceding steps is passed through a further packet of compact filter material filtering out substantially the remainder of the substances, said packets of filtering material being alternately used for treating the stream of mixture in the first and the third steps.

4,145,281

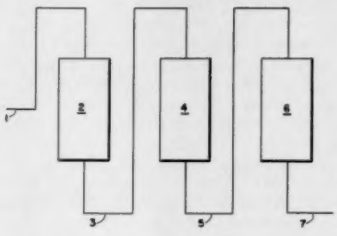
WATER PURIFICATION PROCESS

Michael F. Weishaar, Ballwin, and F. Leon Ballard, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1976, Ser. No. 752,334

Int. Cl.[2] C02B *1/42, 1/56*

U.S. Cl. 210—37 B **1 Claim**



1. A process for the selective removal of chromate, chromium and zinc ions from water containing total dissolved solids as total hardness of 100–1500 ppm, expressed as $CaCo_3$, which comprises contacting said water first with a weakly basic anion exchange resin in a sulfate or chloride form, and then with a weakly acidic cation exchange resin in a sodium form.

4,145,282

PROCESS FOR PURIFYING WASTE WATER CONTAINING FLUORIDE ION

Stanley Bruckenstein, Williamsville, N.Y., assignor to Andco Industries, Inc., Cheektowaga, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,685

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—46 **37 Claims**

1. A continuous process for purifying water containing fluoride which comprises:

(a) continuously adding sufficient calcium composition to a stream of water to provide at least five moles of available calcium in said water for each mole of fluoride in said water;

(b) continuously adding sufficient phosphate composition to said stream, said phosphate composition being selected to provide a pH in the water of from about 6.0 to about 11.5 after its addition;

(c) essentially similtaneously with the addition of said phosphate composition slurrying a seeding composition selected from the group consisting of fluorapatite, calcium fluoride and mixtures thereof into said stream; and

(d) permitting a precipitate to form which comtains essentially all fluoride which was present in the water.

4,145,283

PROCESS FOR THE PURIFICATION OF WASTE WATER

Alwin Topp, Hofheim am Taunus; Klaus Schmiedel, König-Stein, Taunus, and Georg Schaeffer, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt (Main), Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,374

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2657011

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—63 R **8 Claims**

1. In a process for the purification of waste water obtained during the preparation of a hydroxy aromatic by caustic alkaline melt of aryl sulfonic acid or aryl sulfonate to form a molten product wherein the molten product is dissolved in water or in an aqueous saline solution, the strongly alkaline liquor obtained is neutralized with sulfur dioxide or sulfuric acid and any

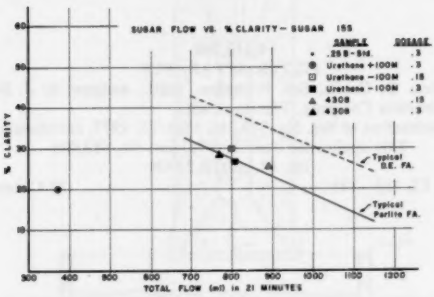
precipitating salts and the hydroxy aromatic are separated from the neutralized waste water, the improvement comprising subjecting the neutralized waste water to wet oxidation with oxygen or an oxygen-containing gas at a temperature of rom about 100° to 370° C. under a pressure of from about 1 to 300 bars.

4,145,284

METHOD FOR MAKING POLYMERIC FILTER AIDS AND PRODUCTS THEREOF

Ernest L. Neu, Redondo Beach, Calif., assignor to Grefco, Inc., Bala Cynwyd, Pa.

Filed Mar. 24, 1978, Ser. No. 890,030
Int. Cl.[2] B01D *37/02*
U.S. Cl. 210—75 **3 Claims**



1. A method of filtering a liquid comprising:

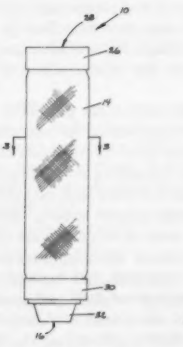
adding to the liquid an effective amount of filter aid material consisting essentially of particulate expanded polymer formed by comminuting polymeric foam to eliminate substantially all closed cells and grading to a desired average particle size range smaller than 100 mesh and larger than 200 mesh, and filtering the liquid through a filter medium.

4,145,285

FUEL CONTAMINATION MONITOR HAVING A SHUT-OFF VALVE

William G. Martin, Bloomfield Hills, and Anthony D. Simone, Troy, both of Mich., assignors to Facet Enterprises, Inc., Tulsa, Okla.

Filed Oct. 26, 1977, Ser. No. 845,694
Int. Cl.[2] B01D *25/22, 25/16*
U.S. Cl. 210—100 **11 Claims**



1. A fluid filtering unit comprising:

a housing having fluid pervious walls for the entrance therethrough of a fluid, and an outlet port for the exit therefrom of the fluid;

a tubular filtering element disposed within the housing permitting fluid flow therethrough from the outside to the inside of the tubular filtering element, said tubular filtering element being in a alignment with said outlet port;

means placing said tubular filtering element under a predetermined axial compression;

valve means disposed at the other end of said tubular filtering element normally closing that end of said tubular filtering element to the passage of fluid, said valve means having one side exposed to fluid pressure inside said tubular filtering element and the other side exposed to fluid pressure outside of said housing so that when a predetermined pressure drop occurs across said valve means, said valve means concurrently opens the end of the tubular filtering element at which it is disposed and closes said outlet port thereby preventing further fluid flow through the filtering unit and,

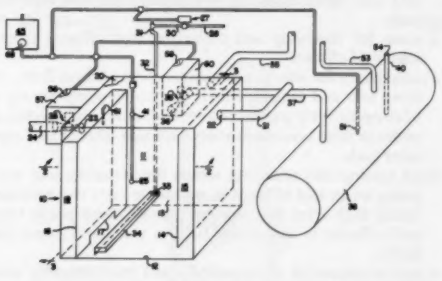
a layer of filtering media disposed within said housing in confronting relationship to said fluid pervious housing wall for separating submicronic particulate matter from the fluid as it passes through said fluid pervious housing wall, said filtering media and said tubular filtering element being in series fluid communication, such that, when a fluid enters said housing through said fluid pervious walls and said filtering media, said fluid next passes through said filtering tubular element toward said outlet, said fluid communication through said outlet being terminated when the pressure drop across either said tubular filtering element and/or said particulate filtering media is above a predetermined level.

4,145,286

AUTOMATIC SYSTEM FOR TRAPPING AND REMOVING WASTE HYDROCARBONS FROM WATER

Fred P. Bereskin, 117 Red Oak La., Highland Park, Ill. 60035, and Joseph J. Borowczyk, 116 West Central Blvd., Villa Park, Ill. 60181

Filed Aug. 1, 1977, Ser. No. 820,553
Int. Cl.[2] B01D *21/24;* B03D *3/00*
U.S. Cl. 210—104 **7 Claims**



1. An automatic system for the recovery from water by flotation of waste such as oil, grease and other hydrocarbons, comprising:

a main collection chamber for receiving influent material including a waste and water mixture from a first gravity feed inlet means, said waste and water mixture normally separating into an upper waste layer and a lower water layer, said chamber having a bottom;

first outlet means disposed at a first selected height above said bottom for maintaining said water layer below a first level within said chamber;

second outlet means disposed at a second selected height above said first height of said first outlet means, said second outlet means maintaining said waste layer below a second level within said chamber;

second inlet means for admitting substantially clean water under pressure into said chamber including a water distribution trough for the rapid admission of the water into

said chamber without undue disturbance and mixing of said upper waste layer and said lower water layer; and,

control means for controlling the operation of said first and second outlet means and said second inlet means relative to one another to allow said lower water layer to be augmented by said water from said second inlet means to increase the level of said lower water layer to that of said second outlet and cause substantially the entire of said upper waste layer to be discharged from said chamber through said second outlet means.

4,145,287

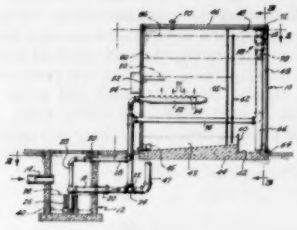
GREASE AND WATER SEPARATING APPARATUS

Harold L. Walker, 1204 E. 95th St., Tacoma, Wash. 98445, and Don B. David, 33412 28th Pl. SW., Federal Way, Wash. 98003

Filed Jan. 17, 1977, Ser. No. 760,095

Int. Cl.[2] B01D *21/24*

U.S. Cl. 210—104 **6 Claims**



1. A device for separating and recovering grease from a waste effluent containing mixed grease and water, and for disposing of said water, comprising:

a separator tank for receiving and holding said effluent while said mixed grease and water separate into a lower water fraction and an upper grease fraction by action of gravity and natural immiscibility, said separator tank having an upper portion, a lower portion, and a wall with an inlet in said wall for introducing said effluent into said separator tank;

a sump for receiving and collecting said effluent from a source of effluent;

a sump pump for selectively pumping said effluent from said sump into said separator tank, said sump pump having an inlet operatively connected to said sump and having an outlet in fluid communication with said inlet of said separator tank;

level sensing and actuating means for actuating said sump pump when said effluent in said sump rises to a predetermined high level and deactuating said sump pump when said effluent in said sump falls to a predetermined low level;

a siphon means for automatically and intermittently withdrawing a portion of said lower water fraction from said lower portion of said separator tank when the upper surface of said upper grease fraction in said separator tank rises to a first predetermined level in said upper portion of said separator tank, and for stopping the withdrawal of said lower water fraction when the upper surface of said upper grease fraction in said separator tank falls to a second predetermined level in said upper portion of said separator tank, said second predetermined level being lower than said first predetermined level, said siphon means including an entry tube and an outlet tube, said entry tube having a wall and having an inlet in fluid communication with said lower portion of said separator tank and extending upwardly therefrom to said upper portion of said separator tank, said entry tube terminating in an opening to the atmosphere above said first predetermined level, said entry tube having an inside diameter larger than the outside diameter of said outlet tube, said outlet tube having an outlet tube inlet inside said entry tube at said second predetermined level, said outlet tube extending upwardly from said outlet tube inlet and passing through said wall of said entry tube at a level between said first and second predetermined levels and having an upper reach at said first predetermined level, said outlet tube extending downwardly from said upper reach and through said wall of said separator tank at a level below said second predetermined level, said outlet tube terminating in a coupling for placing said outlet tube in fluid communication with a drain.

4,145,288

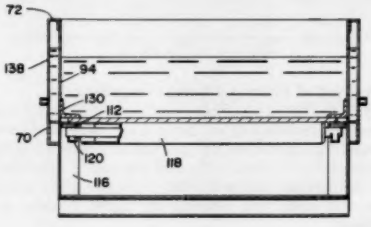
FILTER APPARATUS

William D. Crowe, San Francisco, Calif., assignor to J. R. Schneider Company, Tiburon, Calif.

Continuation of Ser. No. 779,715, Mar. 21, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,098

Int. Cl.[2] B01D *33/04*

U.S. Cl. 210—111 **33 Claims**



1. A filter apparatus comprising:

a frame;

a continuous flexible and pervious conveyor belt;

rotatable means on said frame for supporting said belt so that an inclined upper portion thereof slopes upwardly between two of said rotatable means;

means attached to said frame forming a receiving tank for dirty liquid above said inclined upper portion of said belt and a collection tank for clean liquid below said inclined upper portion and under said receiving tank;

inclined belt support means fixed to said side wall means;

means for feeding a layer of filter media onto said belt so that it can cover the upper surface of its said inclined upper portion;

sealing means around the periphery of said collection tank for preventing outside air and dirty liquid from said receiving tank from entering said collection tank, said sealing means comprising an elongated sealing member fixed to each said receiving tank side wall and spaced above said inclined belt support means, each said sealing member extending over an edge portion of said belt and having a series of spaced apart longitudinally extending grooves forming a labyrinth, and means for supplying clean liquid to said labyrinth of each said sealing means at a pressure greater than the pressure of dirty liquid within the receiving tank, thereby preventing the migration of dirty liquid around the side edges of said belt;

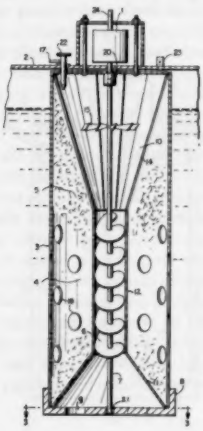
suction means for reducing the pressure within and withdrawing clean liquid from said collection tank; and

drive means for moving said belt forwardly and upwardly along said incline.

4,145,289
AERATION AND FILTRATION PUMP FOR AQUARIUMS

Henry I. Seroussi, 515 West End Ave., New York, N.Y. 10024

Filed Jun. 14, 1977, Ser. No. 806,535
Int. Cl.[2] B01D *35/02*; E04H *3/16*
U.S. Cl. 210—169 8 Claims



1. An aeration and filtration pump particularly adapted for use with aquariums, comprising:

a. a housing formed with a plurality of outlet openings in the wall thereof through which the aerated and filtered air can return to the aquarium tank;

b. an impeller enclosure member positioned within said housing and spaced therefrom along a substantial length of said member, thereby providing a filter chamber, said impeller enclosure member including an intermediate portion, and an upper portion formed with spaced openings;

c. filter means positioned in said filter chamber for filtering water emanating from said spaced openings formed in said upper portion of said enclosure member;

d. a screw impeller positioned within said intermediate portion of said enclosure member for impelling water upwardly within said enclosure member;

e. means for admitting air adjacent the top of said enclosure member,

f. air impelling means mounted above said screw impeller and functioning, when driven, to force air drawn into said enclosure member downwardly for aerating the water impelled upwardly by said screw impeller;

g. water inlet means associated with the bottom of said housing through which water can enter for flow to said screw impeller, and

h. means for rotating said screw impeller and said air impelling means, whereby the water forced upwardly by said screw impeller is aerated and passes through said spaced openings in said enclosure member, through said filter material, and outwardly of said housing through the outlet openings in the housing wall.

4,145,290
SKIMMER FOR OIL SPILLS

Charles E. Nagy, 3221 Bend Pl., Hollywood, Calif. 90068, and John F. Nagy, 785 W. End Ave., New York, N.Y. 10025

Filed Jul. 28, 1977, Ser. No. 819,704
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—242 S 16 Claims

1. A submarine skimmer comprising:

a hull completely submersible in a liquid;

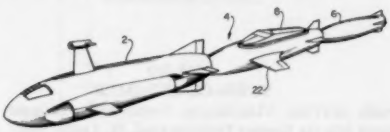
a surge tank within said hull;

a movable funnel having an outlet end hingedly coupled to said surge tank and feeding into said tank, and an inlet end positionable at selected elevations above said hull by rotating said funnel about said outlet end;

seal means adjacent said outlet end of said funnel, said seal means preventing liquid from leaking into said surge tank and into said hull;

lift means coupled to said hull and to said funnel to position said inlet end at said selected elevations;

a conveyor within said funnel for moving liquid from said inlet end down said funnel to said outlet end;



means for removing liquid from said surge tank to outside said hull, said removing means being coupled to said tank and to said hull;

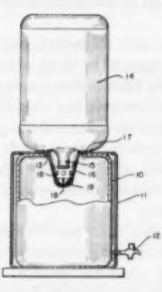
sensing means adjacent said inlet end of said funnel for determining when said inlet end is adjacent the surface of the liquid, said sensing means providing a signal to said lift means so that said lift means maintains said inlet end adjacent the surface of the liquid; and

means for moving said skimmer through said liquid under the surface of said liquid so that said inlet end can move through the liquid adjacent its surface and skim off material from the surface of the liquid.

4,145,291
DISINFECTING MEANS WITHIN A WATER DISPENSER

Ortha M. Console, Glendale, and Alvah M. Griffin, Torrance, both of Calif., assignors to Foremost-McKesson, Inc., San Francisco, Calif.

Continuation of Ser. No. 726,762, Jun. 27, 1976, abandoned.
This application Sep. 7, 1977, Ser. No. 831,262
Int. Cl.[2] C02B *3/10*; B67D *3/00*
U.S. Cl. 210—232 1 Claim



1. In water dispensing apparatus, a container for storing water, a vessel below the container having an upper open end adapted to communicate with the lower open end of the container, means for dispensing water from the vessel, upwardly open basket means generally surrounding and extending below the lower open end of the container, the basket means having openings for flow of water from the interior of the same into the vessel, and a ceramic body disposed within the lower portion of the basket means below said lower open end of the container and immersed in the water within the vessel, said body being formed of porous ceramic material having metallic silver dispersed within the same and adapted to absorb water through its exterior surfaces and retain absorbed water in static condition within the body, said basket and said ceramic body being so disposed as to cause water to flow from the container

downwardly toward and about the exterior surfaces of the body and through the openings in the basket when water is dispensed from the vessel, said ceramic body being provided with ribs on the lower side of the same which support the body on and spaced from the adjacent surface of the basket, and in which the central portion of the body has a hole extending through the same, said ribs serving to aid flow of water about the body.

4,145,292

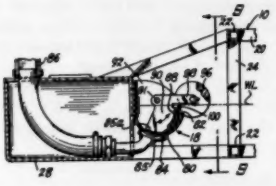
SURFACE SKIMMER

Cornelis in'tVeld, Vlaardingen, Netherlands, assignor to National Marine Service Incorporated, St. Louis, Mo.

Division of Ser. No. 634,505, Nov. 24, 1975, Pat. No. 4,014,795. This application Jan. 11, 1977, Ser. No. 758,453

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—242 R **1 Claim**



1. A skimmer for removing contaminant from the surface of a body of liquid in which the contaminant is immiscible, comprising:

(a) a sump receptacle having an opening at its front;

(b) a generally horizontal overflow lip across the opening, the lip being a predetermined distance above the bottom of the receptacle;

(c) an outflow opening in the bottom of the receptacle;

(d) suction means in communication with the outflow opening;

(e) a moveable weir element located within and extending horizontally across the front of the receptacle and moveable vertically across the opening at least to a predetermined elevation above the overflow lip, the weir element including flotation means causing the weir to be buoyant in the liquid within the receptacle, and an upper overflow weir edge over which surface liquid flows into the receptacle, said element being pivoted for rotation about a horiztonal axis;

(f) an outflow closure for said outflow opening connected to the weir element for movement therewith and arranged to progressively close the outflow opening when the weir element moves toward its lower position, the outflow closure comprising a portion of the weir element located at the side portion thereof opposite the said overflow weir edge and being integral with the weir element, the inside front and bottom surfaces of the receptacle comprising a continuous curved surface, with the weir element comprising a similar curved member disposed contiguous to the inside front and bottom surfaces of the receptacle, and the pivot axis of the weir element being located above the said outflow opening between the vertical transverse planes including the outflow opening and the front of the receptacle; and

(g) a float located externally of and in front of the transverse vertical plane including the frontmost wall of the receptacle and connected to the weir element for movement therewith.

4,145,293

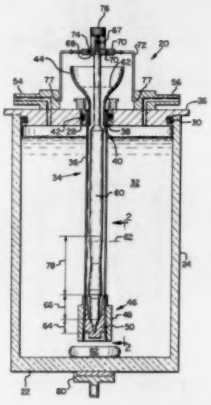
PRECISE CUTOFF CONCENTRATOR-DIALYZER DEVICE

Melvin W. Cook, Beaverton, Oreg., assignor to Bio-Molecular Dynamics, Beaverton, Oreg.

Filed Oct. 14, 1977, Ser. No. 842,095

Int. Cl.[2] C02B *1/82*

U.S. Cl. 210—321 A **8 Claims**



1. A laboratory device for concentrating a liquid sample by extracting material therefrom through a semipermeable membrane, said device comprising:

(a) an upright housing having walls, a top with an aperture formed therein and first coupling means for sealingly and detachably mounting said top on said walls;

(b) container means adapted to be mounted within said housing for holding said liquid sample while said sample is being concentrated, the wall of said container means including a semipermeable elongate membrane mounted in a substantially vertical position so as to contact said sample held in said container means;

(c) second coupling means independent of said first coupling means for sealingly and detachably coupling said container means with said aperture and permitting removal of said container means from said housing through said aperture without the detachment of said top from said housing walls, said aperture being of sufficient size to permit said removal therethrough; and

(d) a sample collection chamber adapted to be mounted within said housing having a top sealingly and detachably interconnected with said membrane adjacent the bottom of said membrane and coupled with the interior of said container means for holding a lower portion of said sample while said sample is being concentrated, said aperture being of a size sufficient to permit removal of said sample collection chamber through said aperture together with said container means.

4,145,294

LIQUID PHASE SEPARATOR WITH VALVED OUTLET MEANS

Milton S. Wilbur, St. Louis County, Mo., assignor to Elizabeth S. Jablecki, La Jolla, Calif.

Filed Oct. 3, 1977, Ser. No. 838,814

Int. Cl.[2] B01D *23/28*

U.S. Cl. 210—419 **5 Claims**

1. A device for separating immiscible liquids having different specific gravities and different visually determinable characteristics comprising a container having an upper end portion and a lower end portion, said container having a relatively large opening in the upper end portion thereof for entry of immiscible liquids to be separated, said container having a

relatively small discharge opening in the lower end portion thereof, said lower end portion being of reduced cross section relative to the upper end portion and said lower end portion having a fluid discharge conduit portion extending downwardly from said discharge opening with the interior of said conduit portion communicating with said discharge opening, and valve means for selectively opening and closing to permit liquid flow through said lower end portion and out said discharge opening to prevent such flow respectively, said valve means comprising a closure member constituted by an integral unit of premolded plastic material, said closure member being positioned above said discharge opening and comprising a body portion having a configuration providing for peripherally sealing contiguous relationship between the periphery of said closure body and corresponding interior surface of said container proximate to said discharge opening, said closure body being movable between a lower position providing said sealingly contiguous relationship and an upper position providing for peripherally noncontiguous relationship between the periphery of said closure body and corresponding interior surfaces of said container portion, said sealingly contiguous relationship preventing liquid in said container from flowing through said discharge opening, said peripherally noncontiguous relationship providing for flow of liquid through said discharge opening and downwardly through said fluid discharge conduit, said closure member having an integrally formed extension portion of a resilient nature extending downwardly from said closure body and into the interior of said fluid discharge conduit, and actuator means cooperable with said fluid discharge conduit interconnected with said closure member extension, and normally actuatable from outside said fluid discharge conduit, for selective movement of said closure body between said lower and upper positions, said actuator means comprising a crankshaft constituted of an integral unit of premolded plastic material, said crankshaft having opposite ends journalled respectively in opposite walls of said fluid discharge conduit and extending transversely thereacross, at least one crank arm integral with said shaft, and a crank pin carried by said crank arm, said closure extension being bifurcate in nature and having a spaced pair of legs remote from said closure body and including oppositely disposed surfaces between said legs defining a slot opening downwardly between said legs, said spaced legs straddling said crank pin, said slot having a relieved area proximally of the lowermost extremities of said legs and providing a cross section for accomodating said crank pin for journalling said closure extension on said crank pin, said relieved area being constituted by oppositely disposed arcuate notches in said oppositely disposed surfaces for resiliently engaging said crank pin, whereby selective rotation of said shaft causes said movement of said closure body, and whereby said closure extension may be readily selectively disengaged from said crank pin by lifting said closure member to cause resilient deformation of said legs permitting withdrawal of said crank pin from said slot.

4,145,295

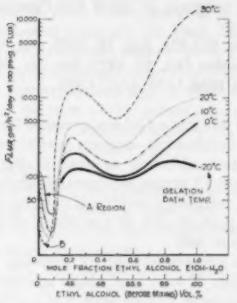
CELLULOSE ESTER ULTRA-FILTRATION MEMBRANES AND THEIR MANUFACTURE

Oleh Kutowy, North Gower; William L. Thayer, and Srinvasa Sourirajan, both of Ottawa, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 15, 1977, Ser. No. 824,642

Int. Cl.[2] B01D *13/04, 31/00;* **B29D** *27/04*

U.S. Cl. 210—500 M **13 Claims**



1. In a process for producing a cellulosic ester semi-permeable membrane wherein a thin film is cast from a mixture comprising cellulosic ester polymer, pore-forming additive and casting solvent, a portion of the casting solvent may be removed from the film and the film is immersed in a gelation bath containing a polar organic compound which is miscible with said casting solvent, the improvement, for producing an ultrafiltration membrane, comprising controlling the temperature of said gelation bath at a selected temperature in the range −20° C. to +30° C. and selecting said polar organic compound to be an alcohol in a concentration, in said gelation bath greater than that required to produce an initial minimum flux for said membrane, equivalent to point B in FIG. 2*a*.

9. A cellulosic ester ultra-filtration membrane produced by the process of claim **1** having a water flux rate in the range 14–10,000 gals/sq.ft./day at 100 psig. and a magnesium sulphate rejection at 100 psig below about 40%.

4,145,296

WEATHER-DURABLE AQUEOUS FIRE RETARDANT STABILIZED AGAINST GELATION

Thomas U. Fox, Creve Coeur, and Nelson H. Kasten, Webster Groves, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1977, Ser. No. 865,473

Int. Cl.[2] C09K *3/28;* **C08L** *61/28*

U.S. Cl. 252—8.1 **7 Claims**

1. A concentrated ammonium salt composition suitable for use in the preparation of aqueous weather-durable fire retardants which comprises:

(a) An ammonium salt selected from the group consisting of monoammonium orthophosphate, diammonium orthophosphate, monoammonium-alkali metal mixed orthophosphates, diammonium-alkali metal mixed orthophosphates, ammonium-alkaline earth metal mixed orthophosphates, ammonium sulfate, ammonium polyphosphates, substituted ammonium polyphosphates, amide polyphosphates, melamine polyphosphates, and mixtures thereof;

(b) a reactive, water-soluble binder which insolubilizes upon drying;

(c) a water-dispersible, viscosity control agent which imparts thixotropic flow properties to an aqueous dispersion of said composition; and

(d) a gelation inhibitor:

(i) having a thermodynamic acid dissociation (pKa) value greater than 8.0 at 25° C; and

(ii) being present in sufficient amount to maintain an aqueous dispersion of (a), (b) and (c) at a solution pH above about 8.5.

4,145,297

FUEL AND LUBRICANT COMPOSITIONS FOR INHIBITION OR PREVENTION OF OCTANE REQUIREMENT INCREASE

Anthony R. Gatti; James S. Hokanson, and Kenzie Nozaki, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 614,822, Sep. 19, 1975, Pat. No. 4,092,126. This application Oct. 11, 1977, Ser. No. 841,084

Int. Cl.[2] C10M *1/10, 3/02;* **C10L** *1/12, 1/32*

U.S. Cl. 252—25 **12 Claims**

1. An improved lubricating oil composition for use in spark-ignition internal combustion engines containing an octane requirement increase-inhibiting amount in the range from about 0.003 to about 15 grams per quart of lubricating oil of a high surface area, refractory solid acid catalyst having:

(a) an average particle size in the range of about 0.01 to about 5 microns, and

(b) surface acid centers formed by metallic, hydrocarbon insoluble cations of sufficiently high acidity such that the average non-volatile surface acidity is 1 or less, expressed in pKa units.

4,145,298

HYDROGENATED LITHIATED COPOLYMERS GRAFTED WITH ORGANIC NITROGEN COMPOUNDS AS VISCOSITY INDEX IMPROVERS HAVING DISPERSANT PROPERTIES

William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 22, 1977, Ser. No. 826,573

Int. Cl.[2] C10M *1/32, 3/26;* **C08L** *9/00, 147/00*

U.S. Cl. 252—51.5 A **52 Claims**

1. Shear-stable, mineral oil-based compositions comprising a major amount of a mineral base oil, and a minor effective viscosity improving amount of an oil-soluble organonitrogen compound grafted hydrogenated conjugated diene/-monovinylarene copolymer dissolved therein, said copolymer having a polymerized monovinylarene content of about 20 to 70 weight percent with the proviso that when said copolymer contains a random block, the block polymonovinylarene content is in the range of about 15 to 35 weight percent, a number average molecular weight suitable for oil solubility, the extent of hydrogenation of said copolymer such that about at least 95 weight percent of olefinic double bonds having been saturated and less than about 5 weight percent of aromatic double bonds having been saturated, said copolymer characterized as having been prepared by the process which comprises metalating a hydrogenated conjugated diene hydrocarbon/monovinylarene hydrocarbon copolymer, and reacting the resulting metalated hydrogenated copolymer with effective amounts of at least one nitrogen-containing organic compound represented by the general formulae X—Q—$(NR_2^3)_n$ or Y[Q—$(NR_2^3)_n]_m$ wherein each R^3 is the same or different alkyl, cycloalkyl, aryl, or combination radical, Q is a hydrocarbon radical having a valence of n+1 and is a saturated aliphatic, saturated cycloaliphatic, aromatic or combination radical, X is a functional group capable of reaction on a one-to-one basis with one equivalent of polymer metal, Y is or contains a functional group capable of reacting on a one-to-one basis with one equivalent of polymer metal, n is at least one, and m is 2 or 3, thereby preparing said grafted copolymer.

27. Nitrogen-containing grafted hydrogenated conjugated diene hydrocarbon/monovinylarene hydrocarbon copolymers having polymerized monovinylarene content of about 20 to 70 weight percent with the proviso that when said copolymer contains a random conjugated diene/monovinylarene block, the block polymonovinylarene content is in the range of about 15 to 35 weight percent, a number average molecular weight of at least about 20,000, the extent of hydrogenation of said copolymer such that about at least 95 weight percent of olefinic double bonds having been saturated, and less than about 5 weight percent of aromatic double bonds having been saturated, said copolymer characterized as having been prepared by the process which comprises metalating a hydrogenated conjugated diene/monovinylarene copolymer, and reacting the resulting metalated hydrogenated copolymer with an effective amount of a nitrogen-containing organic compound represented by the general formulae X—Q—$(NR_2^3)_n$ or Y[-Q—$(NR_2^3)_n]_m$ wherein each R^3 is the same or different alkyl, cycloalkyl, aryl, or combination radical thereof; Q is a hydrocarbon radical having a valence of n+1 and is a saturated aliphatic, saturated cycloaliphatic, aromatic, or combination radical; X is a functional group capable of reaction on a one-to-one basis with one equivalent of polymer lithium; and Y is or contains a functional group capable of reacting on a one-to-one basis with one equivalent of polymer lithium; n is at least one, and m is 2 or 3, such that the resulting grafted copolymer exhibits a nitrogen content of at least about 0.01 weight percent.

4,145,299

ELECTROGRAPHIC LIQUID DEVELOPERS CONTAINING AZO DYE MARKING PARTICLES DERIVED FROM 2,3-NAPHTHALENEDIOL OR DERIVATIVES THEREOF

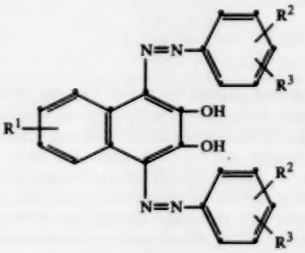
John A. Ford, Jr.; Louis J. Rossi, both of Rochester, and Domenic Santilli, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 691,666, Jun. 1, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 893,108

Int. Cl.[2] G03G *9/12*

U.S. Cl. 252—62.1 L **21 Claims**

1. An electrographic liquid developer comprising a liquid carrier having a dielectric constant of less than about 3 and having a volume resistivity of greater than about 10^{10} ohm-cm., and a marking particle comprising a dye having the formula



wherein:

R^1 is selected from the group consisting of a hydrogen atom, $—SO_2NH_2$ and $—SO_3M$, where M is Na^+ or NH_4^+;

R^2 is selected from the group consisting of lower alkoxy radicals having from 1 to about 4 carbon atoms, $—OCH_2CONH_2$ and

where each of R^6 and R^7 is selected from lower alkyl radicals having from 1 to about 4 carbon atoms; and

R^3 is selected from the group consisting of a hydrogen atom, lower alkyl radicals having 1 to about 4 carbon atoms, a halogen atom, NO_2 and lower alkoxy radicals having from 1 to about 4 carbon atoms.

4,145,300

DEVELOPERS CONTAINING MAGNETIC PARTICLES AND A SUBLIMABLE DYESTUFF

Dieter Hendriks, Geneva, Switzerland, assignor to Sublistatic Holding S.A., Glaris, Switzerland

Filed Sep. 30, 1976, Ser. No. 728,098

Claims priority, application Switzerland, Oct. 7, 1975, 13006/75

Int. Cl.² G03G *9/08, 9/14*

U.S. Cl. 252—62.1 P **16 Claims**

1. A developer in the form of a dry free-flowing powder containing magnetic particles embedded in a mixture of a polymer and between 2.5 and 25% of at least one sublimable or vaporisable dyestuff which, at atmospheric pressure, passes into the vapour state at between 100° and 200° C., and consisting of particles containing particles of magnetic material in a mixture of at least one polymer with a wax, which release the vapors of said dyestuff if heated at the sublimation or vaporisation temperature of said dyestuff.

4,145,301

PROCESS FOR PREPARING MAGNETIC OXIDES

Philippe M. Bruylants, Winksele, Belgium; José J. Fripiat, Orleans, France; Luc W. Rodrigue, Louvain, Belgium; Georges M. Poncelet, Beauvechain, Belgium, and Antonin A. Munaut, Louvain-la-Neuve, Belgium, assignors to Unibra Societe Anonyme, Brussels, Belgium

Filed Nov. 1, 1976, Ser. No. 737,826

Claims priority, application Austria, Oct. 31, 1975, 8298/75

Int. Cl.² C01G *49/06*

U.S. Cl. 252—62.56 **11 Claims**

1. A process for preparing magnetic oxides comprising the steps of (a) preparing a glycerin complex of iron or, a glycerin mixed complex of iron and up to 50% of at least one other metal selected from the group consisting of nickel, chromium, manganese, cobalt, zinc, strontium, yttrium, ruthenium, rhodium, barium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, tungsten and lead by dispersing an iron (II) salt, or an admixture of an iron (II) salt and a salt of one or more of the metals set forth in the above defined group, into an excess of glycerin, progressively heating the resultant mixture up to a temperature of between 110 and 290° C. while stirring for two to twenty hours, cooling the reaction mixture, removing the excess glycerin by washing, and then drying the glycerin complex and (b) decomposing said glycerin complex into the corresponding mono- or polymetal magnetic oxide by hydrolysis in boiling water or in a Soxhlet apparatus followed by annealing the obtained oxide in an atmosphere of an inert gas at a temperature of from about 300° C. to about 500° C., thereby producing mono or polymetal magnetic oxide.

4,145,302

DETERGENT-CONTAINING CLEANSING ARTICLE

Robert B. Doan, Drexel Hill, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 697,510, Jun. 18, 1976, abandoned. This application May 26, 1978, Ser. No. 909,881

Int. Cl.² C11D *1/37, 17/04*

U.S. Cl. 252—91 **11 Claims**

1. An improved detergent pad comprised of a porous cleansing article having incorporated therein a dry water-activated detergent mixture comprised of a first component selected from the organic sulfonic acid and sulfuric acid ester salts of lithium, sodium, potassium, ammonium, magnesium and mixtures of these and a second component selected from the organic sulfonic acid and sulfuric acid ester salts of calcium, barium, and mixtures of these, the sulfonic acid and sulfuric acid esters from which said first and second components are prepared containing about 8 to 20 total non-aromatic ring carbon atoms and being selected from the group consisting of alkylaryl sulfonic acids, alpha-olefin sulfonic acids, primary alkyl sulfuric acid esters, secondary alkyl sulfuric acid esters, and mixtures of these, the cation equivalents ratio of said first and second components being about 10:1 to 1:10, and the total amount of said first and second components in said detergent pad being about 0.5 to 50%, based on the total weight of the detergent-containing pad.

4,145,303

CLEANING AND TREATING COMPOSITIONS

Basil L. Loudas, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 338,935, Mar. 7, 1973, Pat. No. 3,901,727, which is a continuation-in-part of Ser. No. 122,143, Mar. 8, 1971, abandoned. This application Jun. 2, 1975, Ser. No. 583,040

The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.

Int. Cl.² C11D *7/06*

U.S. Cl. 252—156 **3 Claims**

1. A container-stable, water-dilutable, alkaline treating composition capable of imparting water and oil repellency and stain resistance to a substrate, the composition consisting essentially of in an aqueous medium:

(a) at least one fluorochemical compound having the formula: $(R_f)_a$—X—$(A)_b$ where R_f is a fluoroaliphatic radical, a is an integer of 1 or more, X is a linking group having a valence of a plus b and being less electronegative than a $-CF_2-$ group, A is an acid group, and b is an integer of 1 or more, said fluorochemical compound being present in an amount sufficient to impart water and oil repellency to a substrate,

(b) a water-dispersible Lewis base present in an amount sufficient to temporarily maintain said composition above about pH 8 when said composition is exposed to the atmosphere under conditions of use, said Lewis base being selected from the group consisting of ammonia, morpholine, and volatile alkylamines, and

(c) at least one zinc or zirconium coordination complex which is water-dispersible at least above about pH 8 and which provides sufficient zinc or zirconium ions below about pH 8 which are capable of combining with substantially all of the acidic radicals present in said composition.

4,145,304

RESIN AND METHOD FOR REMOVING ANTIMICROBIALS FROM BODY FLUIDS

Joseph L. Melnick, 8838 Chatsworth Dr., and Craig Wallis, 11002 Hedwig Green, both of Houston, Tex. 77024

Filed Dec. 2, 1977, Ser. No. 856,851

Int. Cl.² B01J *1/04;* B01D *15/04;* G01N *31/04, 33/16*

U.S. Cl. 252—182 **11 Claims**

1. A resin for selectively removing an antibiotic from a bacterially infected body fluid specimen, which comprises a microporous resin coated with a non-ionic detergent, which resin is characterized by the ability to adsorb an antibiotic and is selected from the group consisting of anion exchange resins and non-functional adsorbent resins.

9. A resin for selectively removing bacterial inhibitors from body fluid specimens, which comprises a microporous non-functional resin adsorbent, coated with a non-ionic detergent, in combination with a cationic exchange resin.

4,145,305

PHOSPHORUS ACTIVATORS FOR PERCOMPOUNDS

Michel Démarcq, Lyons; Michel Bakes, La Celle Saint Cloud, and Marie-Christine Daude-Lagrave, Paris, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jun. 1, 1977, Ser. No. 802,515

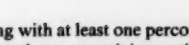
Claims priority, application France, Jun. 4, 1976, 76 16927

Int. Cl.² C11D *3/395, 7/54;* D06L *3/02*

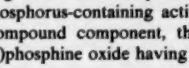
U.S. Cl. 252—186 **4 Claims**

1. Processes for activating percompounds, which processes

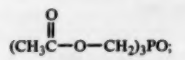
comprise associating with at least one percompound a quantity of at least one phosphorus-containing activator sufficient to activate the percompound component, the activator being tris(acetoxymethyl)phosphine oxide having the formula



tris(acetoxymethyl)phosphine having the formula



or a tetrakis(acetoxymethyl)phosphonium compound having the formula



wherein X is an organic or inorganic ion.

4,145,306

CALCIUM HYPOCHLORITE COMPOSITION

Seiji Tatara, Tokyo; Yoshiki Domori, Niigata; Masashi Kumoda, Joetsu, and Yusuke Endo, Nakago, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 774,948
Claims priority, application Japan, Mar. 25, 1976, 51-31953
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—187 H **8 Claims**

1. A heterogenous mixture of at least 0.3 parts by weight of (A) and 1 part by weight of (B), which comprises a stable, safe, granular calcium hypochlorite composition containing at least about 55% of available chlorine; where

(A) is a hydrated calcium hypochlorite composition containing more than about 50% of available chlorine and keeping an amount of crystallization water corresponding to from 2 to 3 moles per mole of $Ca(OCl)_2$ in the form of $Ca(OCl)_2.3H_2O$, and

(B) is an anhydrated calcium hypochlorite composition containing about 65% or more of available chlorine and less than 2% of crystallization water.

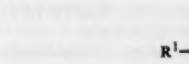
4,145,307

MANUFACTURE OF WATER-IN-OIL EMULSIONS

Heinz Krapf, Hessheim; Knut Oppenlaender, Ludwigshafen, and Karl Seib, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

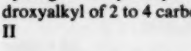
Division of Ser. No. 792,730, May 2, 1977, abandoned. This application May 5, 1978, Ser. No. 902,909
Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623085
Int. Cl.[2] B01J *13/00*; C07C *89/02, 91/12, 91/18*
U.S. Cl. 252—309 **6 Claims**

1. In a process for the production of water-in-oil emulsions at a temperature of about 65° to 80° C., wherein water is added in small portions to an oily or fatty phase containing an emulsifier, said added water having a temperature of from 1° to 5° C. above that of the fatty or oily phase, the improvement which comprises using as the emulsifier a reaction product obtained by reacting a saturated or unsaturated fatty alcohol of 9 to 22 carbon atoms, or their mixtures, with epichlorohydrin in the presence of an acid catalyst, in a molar ratio of from 1:0.5 to 1:1.5, and then reacting the resulting glycidyl ether with a compound of the formula I



I

where R^1 and R^2 are identical or different radicals and are each hydrogen or hydroxyalkyl of 2 to 4 carbon atoms, R^3 is hydroxyalkyl of 2 to 4 carbon atoms or is a radical of the formula II



II

in which case R^1 and R^2 must be hydrogen, Y is —O— or —NH—, m is 2 or 3, m′ is 2 or 3 and may be identical to or different from m, n is from 0 to 6 and X is NH_2 or OH, in a molar ratio of glycidyl ether to the compound of the formula I of from 1:0.1 to 1:6.0, in the presence of an acid or alkaline catalyst.

4,145,308

ANTI-FOAM SILICONE EMULSION, AND PREPARATION AND USE THEREOF

E. Thomas Simoneau, Greenwich, and John J. Sheridan, Jr., Mechanicville, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 7, 1977, Ser. No. 813,600
Int. Cl.[2] B01D *19/04*
U.S. Cl. 252—321 **20 Claims**

1. An anti-foam silicone emulsion composition consisting essentially of a diorganopolysiloxane polymer having a viscosity varying from 100 to 100,000 centipoise at 25° C. where the organo groups are selected from the class consisting of monovalent hydrocarbon radicals and halogenated hydrocarbon radicals and from 1 to 15% by weight of said diorganopolysiloxane of a condensed silicone resin composed of $R_3SiO_{0.5}$ units and SiO_2 units having a silanol content below 0.5% by weight where the ratio of the monofunctional units to the tetrafunctional units varies from 0.25 to 0.75 where R is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and which emulsion contains from 10 to 40% by weight of the diorganopolysiloxane of emulsifying agents and water.

20. A process defoaming a foamed composition consisting essentially of adding to said foamed composition an effective amount of silicone emulsion composition composed of a diorganopolysiloxane polymer having a viscosity varying from 100 to 100,000 centipoise at 25° C. where the organo groups are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and from 1 to 15% by weight of said diorganopolysiloxane of a condensed silicone resin composed of $R_3SiO_{0.5}$ units and SiO_2 units having a silanol content below 0.5 weight percent where the ratio of monofunctional units to tetrafunctional units varies from 0.25 to 0.75 where R is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and which emulsion contains from 10 to 40% by weight of the diorganopolysiloxane of emulsifying agents and water.

4,145,309

DEFOAMER FOR HIGH STRENGTH ACID MEDIA

William A. Satterwhite, Englishtown; Robert M. Leach, Cranbury, and Harold A. Stuhler, Browns Mills, all of N.J., assignors to Cities Service Company, Tulsa, Okla.

Continuation of Ser. No. 665,753, Mar. 11, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,583
The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.
Int. Cl.[2] B01D *17/04*
U.S. Cl. 252—358 **21 Claims**

1. A defoamer for controlling the foam in high strength acid media comprising:

(i) from about 48.8 wt% to about 97.5 wt% of a sulfonated petroleum oil;
(ii) from about 1.2 wt% to about 42.8 wt% of an alcohol having from about 4 to about 20 carbon atoms; and
(iii) from about 0.1 wt% to about 50 wt% of nonionic additive having a formula $R\text{-}O(R'\text{-}O)_nR''$ wherein R' is hydrocarbyl, R and R'' are hydrocarbyl or hydroxyhydrocarbyl, and n is an integer of from 1 to about 200.

4,145,310

DEFOAMER FOR HIGH STRENGTH ACID MEDIA

William A. Satterwhite, Englishtown; Robert M. Leach, Cranbury, and Harold A. Stuhler, Browns Mills, all of N.J., assignors to Cities Service Company

Continuation of Ser. No. 664,595, Mar. 8, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,781
The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.
Int. Cl.[2] B01D *19/04*
U.S. Cl. 252—358 11 Claims

1. A defoamer for controlling the foam in high strength acid media comprising:
(a) from about 57.1 wt % to about 97.6 wt % of sulfonated petroleum oil; and
(b) the balance of an alcohol having from about 4 to about 20 carbon atoms.

4,145,311

PROCESS FOR REACTIVATING FLUORINATION CATALYSTS

Sigmar P. von Halasz, Kelkheim, and Jürgen Korinth, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,641
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702360
Int. Cl.[2] B01J *27/32*
U.S. Cl. 252—415 5 Claims

1. A process for reactivating a chromoxyfluoride fluorination catalyst which comprises treating the catalyst with elementary fluorine at a temperature of from 70° to 300° C.

4,145,312

POLYMERIZATION CATALYST

Ian A. Matheson, Edinburgh, Scotland, assignor to BP Chemicals Limited, London, England

Filed May 18, 1977, Ser. No. 798,179
Claims priority, application United Kingdom, May 24, 1976, 21330/76; Nov. 25, 1976, 49183/76
Int. Cl.[2] C08F *4/02, 4/10*
U.S. Cl. 252—429 B 13 Claims

1. A process for preparing a supported Ziegler catalyst comprising bringing together at a temperature from about 0° to 240° C. a substantially free from moisture magnesium-containing support material selected from the group consisting of magnesium oxide, magnesium hydroxide, and magnesium hydroxy chloride having a particle size in the range 1 to 500 microns and containing at least some hydroxyl groups with a halogen-containing titanium compound having the formula $Ti(OR)_nCl_{4-n}$ wherein n has any value from 0 to 3 inclusive and R is a hydrocarbon group, in the presence of an unreacted tin compound having the formula $Sn(OR')_mX_{4-m}$ wherein R' is a hydrocarbyl radical, m is 0–4 and X is halogen, the concentration of supported titanium being in the range of about 0.1 to 30% based on the total weight of catalyst and the quantity of tin compound being in the range of from 0.2 to 20,000 millimoles per kilogram of support material.

4,145,313

NOVEL TRIALKYL ALUMINUM COCATALYST

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 790,832, Apr. 25, 1977, and a continuation-in-part of Ser. No. 790,837, Apr. 25, 1977. This application Jul. 5, 1977, Ser. No. 812,530
Int. Cl.[2] C08F *4/64, 4/68*
U.S. Cl. 252—429 B 31 Claims

1. An improved catalyst composition adaptable for use in alpha-olefin polymerization which comprises a mixture of:
(a) a transition metal compound on a support, said transition metal compound selected from the group consisting of VCl_3, VBr_3, $TiCl_3$, $TiCl_4$, $TiBr_3$ and $TiBr_4$ and mixtures thereof; and
(b) at least one alkyl metal compound having the formula:

$$R_nMR'_{3-n}$$

wherein R' is selected from the group consisting of C_1 to C_{20} primary alkyl, primary alkenyl, and primary aralkyl groups and hydride; R is attached to M through a secondary or tertiary carbon atom and is selected from the group consisting of C_3 to C_{20} secondary and tertiary alkyl, cycloalkyl, alkenyl and aralkyl groups, M is selected from the group consisting of aluminum, gallium and indium and $n = 1$ to 2, wherein said composition includes at least one Lewis base selected from the group consisting of amines, esters, phosphines, phosphine oxide, phosphates, amides, ketones and ethers, with the proviso that said Lewis base does not cause excessive cleavage of metalcarbon bonds of said $R_nMR'_{3-n}$ or loss of active sites, a molar ratio of said alkyl metal compound to said transition metal compound being about 0.5:1 to about 50:1.

4,145,314

PREPARATION OF HIGHLY DISPERSED SUPPORTED GROUP VIII METAL CATALYSTS AND THE REDISPERSION OF SINTERED OR AGGLOMERATED SUPPORTED GROUP VIII METAL CATALYSTS BY THE ADDITION OF PHOSPHORUS

Shun C. Fung, Edison, and Yen-Chi Pan, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 17, 1977, Ser. No. 807,521
Int. Cl.[2] B01J *27/14, 27/24, 37/00*
U.S. Cl. 252—437 49 Claims

1. A process for preparing Group VIII noble metal compositions, wherein the Group VIII noble metal particle size is less than 100Å, supported on a high surface area solid support selected from the group consisting of carbon, alumina, silica, silica-alumina, zeolite, kieselguhr, vermiculite, the refractory oxides of Group IVb and Vb transition metals, and mixtures thereof, wherein the process consists of the steps of:
(a) depositing onto said support at least one Group VIII noble metal by impregnating said support with a water soluble Group VIII noble metal salt selected from the group consisting of Group VIII noble metal chloride. Group VIII noble metal nitrate and Group VIII noble metal ammonia complexes and reducing said Group VIII noble metal; salt to the Group VIII noble metal;
(b) depositing onto said support elemental phosphorus in an amount sufficient to result in a phosphorus-Group VIII noble metal atomic ratio of about 0.3 to about 3.0, wherein steps (a) and (b) may be performed sequentially in any order;
(c) heating said composition resulting from the completion of steps (a) and (b) in an inert atmosphere at a temperature in the range of about 400° C. to about 750° C., and a pressure in the range of about 0.1 atmospheres to about 10 atmospheres, for a time sufficient to form supported Group VIII noble metal-phosphorus compounds;
(d) decomposing said composition resulting from the completion of step (c) by either reacting said composition with

an oxygen-containing atmosphere at a temperature in the range of about 0° C. to about 150° C., or reacting said composition with water at a temperature in the range of about 20° C. to about 100° C.

4,145,315

SILICA-MODIFIED ZEOLITE CATALYST

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 753,748, Dec. 23, 1976, Pat. No. 4,100,219, which is a continuation-in-part of Ser. No. 672,194, Mar. 31, 1976, Pat. No. 4,060,568. This application Dec. 20, 1977, Ser. No. 862,461

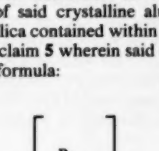
Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z **11 Claims**

1. A catalyst composition comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12 and containing within the interior crystalline structure thereof added amorphous silica in an amount of at least about 0.3 weight percent, introduced therein as a result of (1) contact with a silicone under conditions such that the silicone is sorbed into the pores of the crystalline aluminosilicate zeolite and (2) subsequent calcination, said catalyst being characterized by a n-hexane sorption capacity at a temperature of 90° C. and a n-hexane partial pressure of 83 mm. of mercury which is at least 1 percent less than the corresponding sorption capacity under identical conditions for the unmodified zeolite.

5. A method for preparing a catalyst composition which comprises sorbing into the pores of a crystalline aluminosilicate zeolite, characterized by a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, a silicone of such molecular dimensions that it readily enters the pores of said zeolite, and calcining the resulting product in an oxygen-containing atmosphere at a temperature between about 300° and about 700° C. for 1 to 24 hours to yield a composite of said crystalline aluminosilicate zeolite having amorphous silica contained within its interior structure.

7. The method of claim 5 wherein said silicone is characterized by the general formula:



where R_1 and R_2 are individually selected from the group consisting of hydrogen, methyl, fluorine, chlorine and hydroxy and n is an integer of at least 3.

4,145,316

PREPARATION OF CATALYSTS OF PREDETERMINED PORE SIZE DISTRIBUTION AND PORE VOLUME

Harry E. Robson, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 27, 1977, Ser. No. 864,322

Int. Cl.[2] B01J *21/04, 23/24, 23/40, 23/74*

U.S. Cl. 252—465 **18 Claims**

1. In a process for preparing an alumina for subsequent incorporation with a Group VI-B or Group VIII metal, or both, or alumina precipitated as a hydrogel cogelled with a Group VI-B or Group VIII metal, or both, to form a catalyst, the alumina being precipitated as an alumina hydrogel from a solution which contains a hydrous form of alumina and an anion soluble in an alkaline medium and which forms a soluble aluminum salt,

the hydrogel of alumina being precipitated from a solution which contains alumina in concentration ranging from about 1 to about 5 percent, based on the weight of solution, at pH ranging from about 8 to about 12, and at temperatures ranging from about 15° F. to about 120° F.,

the alumina hydrogel being separated from the solution,

the alumina hydrogel being contacted with a solution of a water soluble polymer containing from about 2 to about 24 monomer units from the group consisting of (a) polyethylene glycols, (b) polypropylene glycols, and (c) polyethylene amines sufficient to absorb the polymer into the pores of the alumina hydrogel and displace water from the pores until the weight ratio of polymer:alumina within the hydrogel ranges from about 0.5:1 to about 4:1,

the hydrogel being dried, and then calcined to form gamma alumina, the catalyst composite which includes the Group VI-B or Group VIII metal, or both, being characterized, when the catalyst is of size ranging from about 1/50 inch up to 1/25 inch average particle size diameter, as having at least about 15 percent of its total pore volume of absolute diameter within the range of about 150Å to about 250Å; when the catalyst is of size ranging from about 1/25 inch to about ⅛ inch average particle size diameter, as having at least about 15 percent of its total pore volume of absolute diameter within the range of about 175Å to about 275Å; and wherein, in each of these catalysts of differing ranges of particle size distributions, the pore volumes resultant from pores of 50Å, and smaller, are minimized; the surface areas and pore volumes of the catalysts being interrelated with particle size, and pore size distributions, surface areas ranging at least about 200 m^2/g to about 600 m^2/g with pore volumes ranging from about 0.8 to about 3.0 cc/g (B.E.T.),

the improvement comprising

contacting, and peptizing the hydrogel of alumina after its precipitation from said solution, and prior to the time that it is calcined and transformed into gamma alumina with an aqueous solution of a monocarboxylic or polycarboxylic acid.

4,145,317

PRESSURE-SENSITIVE RESISTANCE ELEMENTS

Ryoichi Sado, Saitama, and Kazutoki Tahara, Omiya, both of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Japan

Filed Nov. 23, 1977, Ser. No. 854,322

Claims priority, application Japan, Nov. 29, 1976, 51-143187

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—512 **7 Claims**

1. A pressure-sensitive resistance element which comprises a matrix of an electrically non-conductive rubbery elastomer and electrically conductive particles mixed with said matrix in an amount ranging from about 5 to about 40% by volume based on the whole volume of said matrix, said conductive particles being dispersed through said matrix, with a distribution varying in a gradient from one side to the other of the matrix in such a manner that the difference in the average contents of the conductive particles in the two outer layers of three layers of an equal thickness formed by dividing the element with planes perpendicular to the direction of the gradient of distribution is in the range from about 1 to about 30% by volume.

4,145,318

EXCELLENT FLAME-AND SMOKE-RETARDANT NON-SHRINKABLE POLYURETHANE FOAM

Takashi Ohashi, Iruma; Toru Okuyama, Sagamihara; Katsuhiko Arai, Kodaira; Yoshiko Taniguchi, Higashi-Murayama; Masumi Saito, Tanashi, and Ryozo Sakata, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 1, 1977, Ser. No. 821,015

Claims priority, application Japan, Jul. 30, 1976, 51-90165

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—112 **16 Claims**

1. An excellent flame- and smoke-retardant non-shrinkable

polyurethane foam prepared by reacting an organic polyisocyanate with a polyhydroxyl compound consisting of

(A) a polyol having at least two hydroxyl groups and having a molecular weight from 1,000 to 10,000 and

(B) at least one aliphatic amino alcohol from the group consisting of diethanolamine, diisopropanolamine, triethanolamine, hydroxyethylated ethylenediamine, hydroxypropylated diethylenetriamine, 2-amino-2-methyl-1,3-propanediol, 2-amino-2-ethyl-1,3-propanediol and tris(hydroxymethyl) aminomethane, in the presence of water and/or other blowing agents, catalysts and surfactants,

wherein the amount of the aliphatic amino alcohol is 2.1 to 8.0 equivalents per hydroxyl group of the polyol (A).

4,145,319

PROCESS FOR PREPARING WATER-SOLUBLE ALKYDS MODIFIED WITH MULTIFUNCTIONAL MONOMERS

Edward J. Kuzma, Woodbridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,377

Int. Cl.[2] C09D *3/64, 3/66, 3/68, 5/02*

U.S. Cl. 260—22 CB **9 Claims**

1. A water reducible alkyd resin comprising the neutralized reaction product of

(a) an alkyd resin having an acid number of about 10 or less,

(b) a polycarboxylic acid or anhydride having at least three free carboxyl groups for reaction, said polycarboxylic acid being present in the amount to provide an acid number of the reaction product of alkyd resin and polycarboxylic acid in the range from about 50 to about 60, and

(c) about 0.5 to 10% by weight based on the total reaction mixture of a multifunctional polyol derivative of acrylic or methacrylic acid esters of a polyol in which at least two hydroxy groups are esterified.

4,145,320

POLYMERS CONTAINING POLYUNSATURATED ACID RADICALS, PROCESS FOR THEIR PREPARATION AND USE THEREOF

Paolo Ferruti, V.le Cassiodoro, 24, and Rodolfo Paoletti, V.le Regina Margherita, 43, both of Milan, Italy

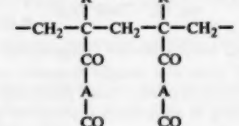
Continuation-in-part of Ser. No. 622,441, Oct. 14, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,546

Claims priority, application Italy, Oct. 15, 1974, 28419 A/74

Int. Cl.[2] C08F *8/14, 8/32;* **C08L** *33/02*

U.S. Cl. 260—23 AR **10 Claims**

1. A non-toxic polymer having a molecular weight between 1,000 and 1,500,000 characterized in that it contains the radical of a polyunsaturated acid selected from the group consisting of 8,11,14-eicosatrienoic acid; 5,8,11,14-eicosatetraenoic acid; and 5,8,11,14,17-eicosapentenoic acid, bound to a macromolecular backbone of polyacrylic or polymethacrylic units through oxyalkylenic, aminoalkylenic, or oxyaminoalkylenic chains, said polymer containing units of the formula



wherein R is H or CH_3, A represents an alkylene radical terminated at its ends with an —NH— group or an —O— group, and B represents a radical of such polyunsaturated acid sans a carboxyl group.

4,145,321

PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS AND PROCESS FOR PREPARING THEM

Cedric Lee, Harlow, England, assignor to Revertex Limited, Harlow, England

Filed Nov. 14, 1977, Ser. No. 851,563

Int. Cl.[2] C08F *8/46;* **C08L** *93/00;* **C09J** *7/02*

U.S. Cl. 260—27 BB **29 Claims**

1. A pressure-sensitive adhesive composition comprising a blend of:

(a) the reaction product of maleic anhydride and a liquid polymer comprising at least a major proportion of butadiene, said reaction product comprising intact maleic anhydride units randomly distributed on the liquid polymer structure;

(b) at least one solid tackifier resin;

(c) at least one curing agent; and

(d) less than 20% by weight of volatile liquid.

4,145,322

PROCESS FOR PREPARING BITUMEN-POLYMER COMPOSITIONS

Paul Maldonado, Saint Symphorien d'Ozon; Jean Mas, Chaponnay, and Trung K. Phung, Vienne, all of France, assignors to Elf Union, Paris, France

Filed Dec. 28, 1977, Ser. No. 865,245

Claims priority, application France, Dec. 28, 1976, 76 39233

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 AS **18 Claims**

1. A process for obtaining a bitumen-polymer composition which consists in contacting with each other, at a temperature between 130° and 230° C., 80 to 98% by weight of a bitumen exhibiting a penetration value between 30 and 220, and 2 to 20% by weight of a block copolymer, with an average molecular weight between 30,000 and 300,000 having the theoretical formula $S_x - B_y$ in which:

S corresponds to the styrene structure groups,

B corresponds to the conjugated diene structure groups,

x and y are integers,

stirring the obtained mixture for at least two hours, then adding 0.1 to 3% by weight of elemental sulphur with respect to the bitumen and maintaining the mixture thus obtained under agitation for at least 20 minutes.

4,145,323

AQUEOUS COATINGS BASED ON EPOXY ESTER COPOLYMERS

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jun. 6, 1977, Ser. No. 804,002

Int. Cl.[2] C08L *61/10*

U.S. Cl. 260—29.3 **15 Claims**

1. A copolymer dispersible in water with the aid of a volatile base comprising a solution copolymer of a resinous polyepoxide esterified to be epoxy-free with from about 0.3 to about 1.5 moles of at least one monocarboxylic acid containing conjugated ethylenic unsaturation per mol of polyepoxide, said esterified polyepoxide being Diels Alder adducted with from 3% to 10%, based on the weight of the copolymer, of an ethylenically unsaturated dicarboxylic acid, and said adduct being copolymerized with from 10% to 50%, based on the weight of the copolymer, of monoethylenically unsaturated nonreactive monomer containing a terminal ethylenic group.

4,145,324

COATINGS BASED ON HYDROLYZED EPOXY RESINS

Albert C. Chen, East Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 9, 1977, Ser. No. 767,006

Int. Cl.[2] C08L *61/28, 63/00*

U.S. Cl. 260—29.4 R **8 Claims**

1. A coating formulation of:

(a) an oil-in-water emulsion consisting essentially of a solution of a hydrolyzed poly-1,2-epoxy resin, a non-ionic surfactant, a conventional curing agent, and water; or

(b) a solution consisting essentially of a hydrolyzed poly-1,2-epoxy resin and a conventional curing agent in alkoxyethanol or a mixture of alkoxyethanol with alcohols, ketones, carbitols, or acetates of alcohols, ethoxyethanol or carbitols.

4,145,325

FLUOROCARBON POLYMER-PIGMENT-POLYMERIC ADJUNCT COATING COMPOSITIONS STABILIZED AGAINST DISCOLORATION

Eustathios Vassiliou, Newark, Del., and William Van Hoeven, Jr., Wallingford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 775,278, Mar. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 570,951, Apr. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 457,638, Apr. 3, 1974, abandoned. This application Aug. 2, 1977, Ser. No. 820,685

Int. Cl.[2] C08L *57/08*; C08K *3/22*

U.S. Cl. 260—29.6 F **12 Claims**

1. A composition suitable for making a light-colored fused fluorocarbon polymer coating, said composition consisting essentially of

(a) about 25%–95%, by weight of the total of (a) and (b), of a fluorocarbon polymer polymerized or copolymerized from monomers selected from monoethylenically unsaturated hydrocarbon monomers and hydrocarbon ether monomers, said monomers being completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms, the polymer having a number average molecular weight of at least 20,000;

(b) about 2%–75%, by weight of the total of (a) and (b), of pigment;

(c) about 2%–75%, by weight of the total of (a), (b) and (c), of a polymer of ethylenically unsaturated monomers which depolymerizes, and whose depolymerization products vaporize in the temperature range of about 150° C. below the fusion temperature of the fluorocarbon polymer used to about the fluorocarbon polymer's decomposition temperature,

the amounts of (a), (b) and (c) totaling 100%;

(d) enough of at least one compound of at least one of the metals, cobalt, iron, cerium and manganese which compound decomposes in the temperature range of about 100°–500° C. to give at least 0.2%, by weight of the metal in the compound, of an oxide or hydroxide,

to provide at least about 0.005 parts of metal per hundred of (a); and

(e) a liquid carrier.

4,145,326

CORROSION-INHIBITING POLY(ARYLENE SULFIDE) COATING COMPOSITIONS

Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 346,834, Apr. 2, 1973, Pat. No. 4,064,084. This application Sep. 12, 1977, Ser. No. 832,503

Int. Cl.[2] C08F *45/24*

U.S. Cl. 260—29.6 F **9 Claims**

1. A poly(arylene sulfide) coating composition which comprises the mixture of:

(a) normally solid material comprising a normally solid poly(arylene sulfide) resin and at least one normally solid fluorocarbon polymer wherein the weight ratio of said normally solid poly(arylene sulfide) resin to said normally solid fluorocarbon polymer is within the range of about 100:5 to about 100:50,

(b) about 0.5 to about 30 parts by weight of sodium nitrite per hundred parts by weight of said poly(arylene sulfide) resin, and

(c) an inert liquid suspending agent.

4,145,327

PRESSURE-SENSITIVE ANTISTATIC ADHESIVE AND PROCESS FOR THE PREPARATION THEREOF USING AN AQUEOUS LATEX COPOLYMER AND A QUATERNARY AMMONIUM SALT

Ronald G. Dolch, Budd Lake, N.J., and Robert N. Kerr, Jr., Reading, Pa., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1978, Ser. No. 866,974

Int. Cl.[2] C08L *33/08*

U.S. Cl. 260—29.6 MN **6 Claims**

1. A novel pressure-sensitive adhesive composition having improved antistatic properties comprising:

an aqueous latex copolymer having

from about 30 to about 60 parts by weight of vinyl acetate per 100 parts of said latex copolymer; and,

from about 40 to about 70 parts by weight of an acrylate selected from the group consisting of 2-ethylhexyl acrylate and butyl acrylate per 100 parts of said latex copolymer;

from about 0.5 to about 5.0 parts by weight of an adhesive-compatible quaternary ammonium salt, per 100 parts of said latex copolymer, incorporated therein; and,

from about 2 to about 4 parts by weight of a nonionic emulsifier per 100 parts of said latex copolymer.

4,145,328

BIMETALLIC ADHESIVE MIXTURE FOR BONDING AND RELEASE APPLICATIONS

Paul W. Juneau, Jr., Norristown, and Martin M. West, Philadelphia, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 581,874, May 29, 1975, abandoned. This application May 31, 1977, Ser. No. 801,682

Int. Cl.[2] C08K *3/08, 5/01, 5/05, 5/07*

U.S. Cl. 260—30.4 R **11 Claims**

1. A bimetallic adhesive for providing a surface to surface bond for fastening, which comprises:

(a) a mixture of boron and titanium powders in the ratio of one atom of titanium to two atoms of boron,

(b) a resinous adhesive binder in a solvent for said mixture said binder in sufficient quantity to comprise 30% to 50% by weight of the bimetallic adhesive after evaporation of the solvent, and

(c) wherein said boron and titanium powders have particle sizes ranging from two microns to thirty microns.

4,145,329

PLASTICIZED POLYCARBONATE COMPOSITION

Victor Mark, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

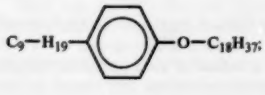
Filed Jun. 29, 1977, Ser. No. 811,067

Int. Cl.[2] C08K *5/06*

U.S. Cl. 260—30.4 R **4 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an organic plasticizer selected from the group consisting of epoxidized soybean oil and those having the following formulae:

(a)



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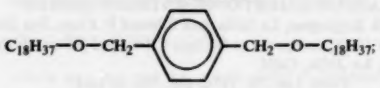
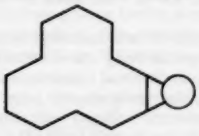
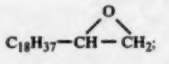


(b)

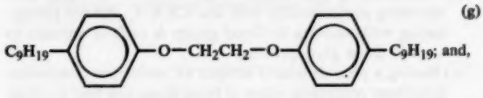


(c)

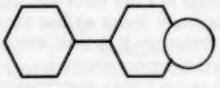
(d) $C_{16}H_{33}—O—C_{16}H_{33}$;
(e) $C_{12}H_{25}—O—C_{12}H_{25}$;



(f)



(g)



(h)

4,145,330
FLAME RETARDANT POLYPIVALOLACTONE COMPOSITIONS

Paul A. Zorzi; Thomas S. Allen, and Michael E. Kucsma, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 14, 1977, Ser. No. 851,051
Int. Cl.² C08K *3/32, 7/14*
U.S. Cl. 260—37 R **11 Claims**

1. A thermoplastic composition which comprises polypivalolactone resin and an inorganic ammonium polyphosphate present in an amount up to about 45 phr sufficient to render the composition flame resistant.

4,145,331
THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS WITH IMPROVED HEAT DISTORTION POINT

Hans-Josef Sterzel, Dannstadt-Schauernheim; Karl Schlichting, Bobenheim-Roxheim, and Wolfgang Seydl, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 8, 1977, Ser. No. 858,745
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659338
Int. Cl.² C08K *3/02, 3/32, 7/14;* C08L *7/02*
U.S. Cl. 260—40 R **10 Claims**

1. A thermoplastic polyester molding composition which comprises

(A) 100 parts by weight of a linear saturated polyester of an aromatic dicarboxylic acid and saturated aliphatic or cycloaliphatic diols,

(B) from 1 to 100 parts by weight of the elastomeric graft copolymer which has a glass transition temperature of below −20° C.,

(C) from 10 to 100 parts by weight of an α-methylstyrene/acrylonitrile copolymer, and

(D) from 10 to 80 parts by weight of a filler.

4,145,332
ADHESIVES

George E. Coxon, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Sep. 20, 1976, Ser. No. 724,518
Claims priority, application United Kingdom, Sep. 26, 1975, 39604/75
Int. Cl.² C08K *3/22*
U.S. Cl. 260—42.52 **3 Claims**

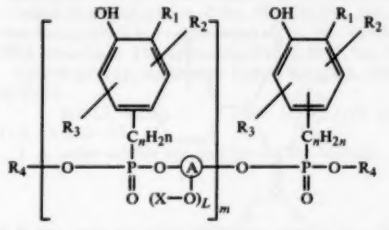
1. In an electric lamp having a bulb or envelope, at least one end cap mounted thereon, and a body of lamp capping cement securing said cap to said tube or envelope, the improvement in which said body of cement comprises the reaction product of a condensation product of an aralkyl ether and a phenol with a cross-linkable carboxylated acrylic polymer, together with a heat-resistant filler.

4,145,333
STABILIZED SYNTHETIC RESIN COMPOSITION

Motonobu Minagawa, Koshigawa; Yutaka Nakahara, Iwatsuki, and Masayuki Takahashi, Tokorozawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

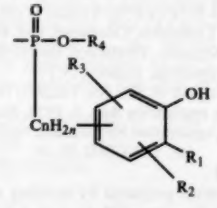
Filed Jul. 20, 1977, Ser. No. 817,499
Claims priority, application Japan, Jul. 20, 1976, 51-86274
Int. Cl.² C08K *5/53;* C07F *9/02*
U.S. Cl. 260—45.8 N **22 Claims**

1. An ortho-hydrocarbyl substituted hydroxyphenylalkylene-phosphonic acid ester of a polycarbocylic polyhydroxy compound having the formula:



(I)

in which R_1 is an alkyl or cycloalkyl group; each of R_2 and R_3 independently are an alkyl or a cycloalkyl group or a hydrogen atom; R_4 is an alkyl, cycloalkyl, arylalkyl, aryl, alkylaryl, or alkylpolyoxyalkylene group or a residue of a polycarbocyclic polyhydric phenol having two to three benzenoid rings linked through at least one atom of carbon, oxygen or sulfur; A is a residue of a polycarbocyclic polyhydroxy compound having 2 to 4 hydroxyl groups and two to three six-membered rings linked through at least one atom of carbon, oxygen, or sulfur; X is a hydrogen atom or the group



L is a number from 0 to 2, m is a number from 1 to 5, and n is a number from 1 to 8.

19. A synthetic resin composition having enhanced resistance to deterioration on exposure to heat and light comprising a synthetic resin selected from the group consisting of ethylene-vinyl acetate copolymers, alkanediolterephthalate linear polyesters, polyvinyl chloride, acrylonitrile-butadiene-styrene

polymer, and olefin polymers, and a hydroxyphenylalkylene-phosphonic acid ester according to claim 1.

4,145,334

POLYESTER IMIDE RESINS

Karl Schmidt; Ferdinand Hansch; Hans-Malte Rombrecht, and Hans-Joachim Beck, all of Hamburg, Fed. Rep. of Germany, assignors to Dr. Beck & Co., A.G., Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 293,879, Oct. 2, 1972, abandoned, which is a division of Ser. No. 659,234, Aug. 8, 1967, Pat. No. 3,697,471, which is a continuation of Ser. No. 238,315, Nov. 2, 1962, abandoned. This application May 4, 1976, Ser. No. 683,435

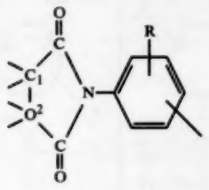
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1961, 64660; Dec. 12, 1961, 65140; Jul. 6, 1962, 67934

The portion of the term of this patent subsequent to Oct. 10, 1989, has been disclaimed.

Int. Cl.[2] C08G *73/16;* C08L *79/08*

U.S. Cl. 528—189 33 Claims

1. Polyester imide resin, said resin having ester groups of acid and alcohol moieties in the chain which are condensation products of at least difunctional carboxylic acid or a derivative of said at least difunctional carboxylic acid which is a functional equivalent thereof and at least difunctional alcohol or a derivative of said at least difunctional alcohol which is a functional equivalent thereof, and also in the chain between said ester groups, moieties of the formula:



in which C_1 and C_2 are part of an aromatic ring, and R is hydrogen or methyl, moieties of said formula being present in an amount effective to improve the thermal stability of the resin without rendering the resin insoluble to an extent which would make it unsuitable for use in a wire lacquer composed of the resin dissolved in cresol and solvent naphtha.

4,145,335

THERMOPLASTIC COPOLYESTERS BASED ON POLY-1,4-BUTYLENE TEREPHTHALATE

Lothar Buxbaum, Lindenfels, Odenwald, Fed. Rep. of Germany, and Jürgen Habermeier, Pfeffingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 742,307, Nov. 16, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,713

Claims priority, application Switzerland, Nov. 26, 1975, 15307

Int. Cl.[2] C08G *63/18*

U.S. Cl. 528—302 9 Claims

1. A molded article prepared by molding a linear thermoplastic copolyester from terephthalic acid, 1,4-butanediol and a saturated aliphatic dicarboxylic acid, having a relative viscosity of at least 1.6, measured at 30° C. on a 1% strength solution in equal parts of phenol and symmetrical tetrachloroethane, wherein, as the aliphatic dicarboxylic acid, 2.5–15 mol%, relative to the polyester, of one or more branched dicarboxylic acids with 7 to 30 carbon atoms per molecule are co-condensed in the polyester in statistical distribution.

4,145,336

CARCINOEMBRYONIC ANTIGEN ISOMER

Thomas S. Edgington, La Jolla, and Edward F. Plow, San Diego, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Apr. 30, 1976, Ser. No. 682,027

Int. Cl.[2] C07G *7/00;* A61K *39/00*

U.S. Cl. 260—112 R 8 Claims

1. The isolated species of carcinoembryonic antigen denominated CEA-S_1, said species being characterized by such physicochemical and immunochemical characteristics as:

(a) having a single, discrete isoelectric point of about 4.5, as measured by isoelectric columns with ampholytes having a pH range of 3 to 6 or by thin layer pH 3 to 9 acrylamide gels containing ampholytes;

(b) having a buoyant density of about 1.41, as measured by isopyknic equilibrium density gradient ultracentrifugation in cesium chloride solution;

(c) having a molecular weight of about 181,000 daltons as calculated from the Svedberg equation;

(d) precipitating with anti-carcinoembryonic antigen, precipitating preferentially with anti-CEA-S_1, but not precipitating with antisera to blood group A or B or antisera to normal tissue glycoprotein;

(e) having a percent bound antigen vs. antiserum concentration linear regression slope of from about one half to about four fifths the slope of a like curve for carcinoembryonic antigen comparatively tested against identical anti-carcinoembryonic antigen in high ionic strength buffer.

4,145,337

AMINOETHYLGLYCINE CONTAINING POLYPEPTIDES

Wallace M. Dairman, Monsey, N.Y.; Arthur M. Felix, West Caldwell, N.J.; Hugo E. Gallo-Torres, Livingston, N.J.; Edgar P. Heimer, Sparata, N.J., and Johannes A. Meienhofer, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 11, 1977, Ser. No. 840,922

Int. Cl.[2] C07C *103/52;* A61K *37/02*

U.S. Cl. 260—112.5 S 14 Claims

1. A compound of the formula

X-Lys-Asn-Phe-Phe-A-Lys-Thr-Phe-Thr-Ser-Y

wherein X independently is selected from H-$(Aeg)_m$-Cys- and H-$(Aeg)_m$-Ala-Gly-Cys-; A is L-Trp or D-Trp; Y independently is Cys-$(Aeg)_n$-OH; X and Y taken together are an aminoethylglycyl radical in the ring position; m and n are independently selected from 0,1,2,3 and 4 provided that at least one of X or Y contains at least one Aeg radial; and the cylic disulfide compounds, the protamine zinc and protamine aluminum complexes and the pharmaceutically acceptable acid addition salts thereof.

4,145,338

PLASTICIZED POLYVINYL ACETATE COMPOSITIONS

Saburo Matsubara, Yokohama, and Sakuya Iwai, Tokyo, both of Japan, assignors to Nippon Oil Co., Ltd., Japan

Filed Dec. 20, 1977, Ser. No. 862,429

Claims priority, application Japan, Dec. 22, 1976, 51-155490

Int. Cl.[2] C08K *5/01*

U.S. Cl. 260—33.6 UA 5 Claims

1. A polyvinyl acetate composition comprising:

(I) 100 parts by weight of polyvinyl acetate or polyvinyl acetate copolymer; and

(II) 0.1 to 50 parts by weight of one or more of plasticizers selected from the compounds defined by the formulae:

$$Ar_1 - R - Ar_2 \quad (i)$$

where Ar_1 and Ar_2 are the same or different benzene or alkylbenzene rings, and R is an alkylene group having a

carbon number of 2 to 3, the compounds of this formula having a molecular weight of from 173 to 263;

$$Ar_1 - R_1 - Ar_2 - R_2 - Ar_3 \quad \text{(ii)}$$

where Ar_1, Ar_2 and Ar_3 are the same or different benzene or alkylbenzene rings, and R_1 and R_2 are the same or different alkylene groups having a carbon number of 2 to 3, the compounds of this formula having a molecular weight of from 300 to 398; and

(iii)

where Ar_1, Ar_2 and Ar_3 are the same or different benzene or alkylbenzene rings, and R is a straight-chain or branched-chain hydrocarbon group having a carbon number of 4 to 6, the compounds of this formula having a molecular weight of from 300 to 398.

4,145,339

WATER-SOLUBLE 1:2-COBALT COMPLEX DYESTUFFS OF AN AZOMETHINE AND OF AN AZO COMPOUND

Hermann Fuchs, Kelkheim, and Klaus Filzinger, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

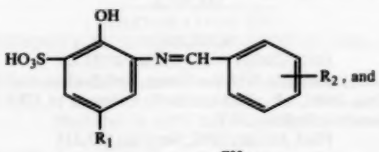
Continuation of Ser. No. 764,996, Feb. 2, 1977, abandoned. This application Dec. 13, 1977, Ser. No. 860,108

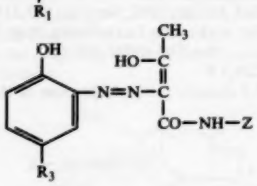
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618020

Int. Cl.[2] C09B *45/20, 45/30, 62/74;* **D06P** *3/24*

U.S. Cl. 260—148 **4 Claims**

1. A 1:2-cobalt complex compound of the compounds





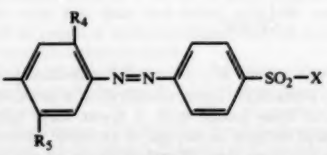
in which

R_1 is chlorine, lower alkyl or nitro,

R_2 is hydrogen, lower alkyl or lower alkoxy,

R_3 is hydrogen, chlorine, nitro or lower alkyl,

Z is



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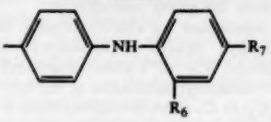
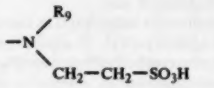


in which

R_4 is hydrogen, lower alkyl or lower alkoxy,

R_5 is hydrogen, lower alkyl or lower alkoxy,

X is hydroxy, sulfoalkyl of from 1 to 4 carbon atoms, or



in which

R_9 is hydrogen or lower alkyl, and

R_6 and R_7 are different from each other and each is nitro or sulfo.

4,145,340

WATER-SOLUBLE REACTIVE MONOAZO DYE CONTAINING A NONYLPHENOXY, CHLOROTRIAZINE GROUP

Denis R. A. Ridyard, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

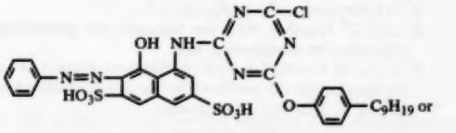
Continuation of Ser. No. 678,356, Apr. 19, 1976, abandoned, which is a continuation of Ser. No. 583,403, Jun. 3, 1975, abandoned, which is a continuation of Ser. No. 437,388, Jan. 28, 1974, abandoned. This application Feb. 2, 1977, Ser. No. 764,989

Claims priority, application United Kingdom, Jan. 30, 1973, 4579/73

Int. Cl.[2] C09B *62/08;* **D06P** *1/382, 3/10, 3/66*

U.S. Cl. 260—153 **1 Claim**

1. A water-soluble azo dye having the formula



the sodium salt thereof.

4,145,341

WATER-SOLUBLE AZO DYES CONTAINING DIAMINOPYRIMIDINE COUPLER COMPONENTS

Johannes Dehnert, and Guenter Dunkelmann, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

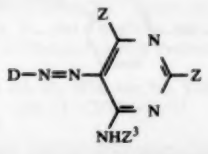
Continuation-in-part of Ser. No. 434,248, Jan. 17, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,525

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1973, 2302582

Int. Cl.[2] C09B *29/36, 31/14, 31/28*

U.S. Cl. 260—154 **12 Claims**

1. A dye of the formula:



in which
D is selected from the group consisting of
(1) phenyl substituted by chloro; bromo; methyl; ethyl; trifluoromethyl; cyano; methylsulfonyl; ethylsulfonyl; phenylsulfonyl; C_1- to C_4-alkoxycarbonyl; carbamoyl; sulfamoyl; sulfamoyl substituted at the nitrogen once or twice by C_1- to C_2-alkyl, β-hydroxyethyl, γ-hydroxypropyl, β-methoxyethyl or γ-methoxypropyl; hydroxysulfonyl; $SO_2NHC_2H_4SO_3H$; or 6-methyl-7-sulfo-2-benzthiazolyl;
(2) phenylazophenyl;
(3) phenylazophenyl substituted by hydroxy, methyl, methoxy, ethoxy, hydroxysulfonyl or $—OC_2H_4—O—SO_3H$;
(4) 3- or 4-phthalimidyl; and
(5) 3- or 4-phthalimidyl substituted at the nitrogen by C_1- to C_4-alkyl, β-hydroxyethyl, β-methoxyethyl, γ-hydroxypropyl, β-hydroxyethoxyethyl, benzyl, phenylethyl, sulfobenzyl, sulfophenylethyl, phenyl or phenyl substituted by methyl or hydroxysulfonyl;
one Z is

and the other Z is hydrogen; C_1- to C_3-alkyl; cyclohexyl; benzyl; sulfobenzyl; phenylethyl; sulfophenylethyl; phenyl; or phenyl substituted by methyl, chloro, methoxy, ethoxy or hydroxysulfonyl; Z^1 is hydrogen; C_1- to C_8-alkyl; C_2- to C_6-alkyl substituted by hydroxy, methoxy, ethoxy or cyano; cyclohexyl; norbornyl; benzyl; sulfobenzyl; phenylethyl; sulfophenylethyl; phenylpropyl; sulfophenylpropyl; phenyl; phenyl substituted by methyl, methoxy, ethoxy, chloro or hydroxysulfonyl; sulfoethyl; $(CH_2)_3OC_6H_5$; $(CH_2)_3OC_6H_4SO_3H$; $(CH_2)_3OCH_2C_6H_5$; $(CH_2)_3OCH_2C_6H_4SO_3H$; $C_2H_4OC_2H_4OH$; $(CH_2)_3OC_2H_4OZ^3$; or $(CH_2)_3O(CH_2)_4OH$;
Z^3 has the meanings given for Z^1;
Z^2 is hydrogen or C_1- to C_4-alkyl;
Z^1 and Z^2 together with the nitrogen are pyrrolidino, piperidino or morpholino; and
Z^3 is C_1- to C_4-alkyl, benzyl, sulfobenzyl, phenyl or sulfophenyl, with the proviso that the dye contains a total of 1, 2 or 3 sulfonic acid groups.

4,145,342

NITRO-DIPHENYLAMINO-AZO-PHENYL DYESTUFFS CONTAINING A POLYALKYENEOXY GROUP

Kersten Trautner, Cologne, and Karl H. Schündehütte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

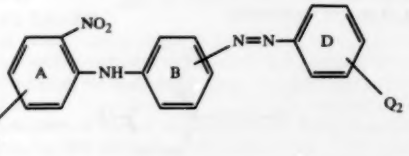
Filed Jul. 6, 1977, Ser. No. 813,314

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630988

Int. Cl.[2] C09B *43/00, 43/18*

U.S. Cl. 260—207 **7 Claims**

1. Azo dyestuffs which are free from sulphonic acid groups and of the formula



wherein
Q_1 and Q_2 independently of one another represent hydrogen or the group $V-(A-O)_nZ$, but do not at the same time represent hydrogen,
A denotes an alkylene group,
V denotes a direct bond or a bridge member,
Z denotes hydrogen, alkyl, aryl, aralkyl or acyl and n denotes an integer from 2–10 and the rings A, B and D can contain further non-ionic substituents customary in azo dyestuff chemistry, and the azo group is in the m-position or p-position to the secondary amino group on ring B.

4,145,343

6'-AMINO-SPIRO[CYCLOALKANE-1,2'-PENAM]-3'-CARBOXYLIC ACID DERIVATIVES

Ludovic Rodriguez, Brussels, and Jacques Leclercq, Braine l'Alleud, both of Belgium, assignors to UCB Societe Anonyme, Saint-Gilles-lez-Bruxelles, Belgium

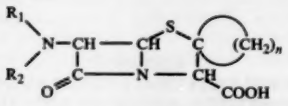
Filed May 24, 1977, Ser. No. 800,083

Claims priority, application United Kingdom, May 25, 1976, 21624/76

Int. Cl.[2] C07D *499/44*

U.S. Cl. 260—239.1 **15 Claims**

1. A member selected from the group consisting of a 6'-amino-spiro[cycloalkane-1,2'-penam]-3'-carboxylic acid compound of the formula



wherein
n is a whole number of from 3 to 6,
R_1 is a hydrogen atom, and
R_2 is a radical selected from the group consisting of 2-phenylacetyl, 2,6-dimethoxybenzoyl, 2-amino-2-phenylacetyl, 5-methyl-3-phenyl-4-isoxazolecarbonyl and 2-carboxy-2-phenylacetyl, or
R_1 and R_2 together represent (hexahydro-1H-azepin-1-yl)methylene, and
a therapeutically acceptable non-toxic salt thereof.

4,145,344

BICYCLOMYCIN DERIVATIVES

Beat Müller, Reinach; Wilhelm Kump, Biel-Benken, and Oskar Wacker, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

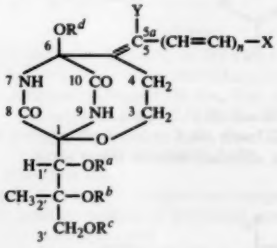
Filed Jul. 20, 1977, Ser. No. 817,314

Claims priority, application Luxembourg, Aug. 2, 1976, 75516

Int. Cl.[2] C07D *498/08*

U.S. Cl. 260—239.3 B **10 Claims**

1. A 2-Oxa-7,9-diazabicyclo[4,2,2]decane of the formula



(I)

wherein each of R^a, R^b, R^c and R^d individually represents hydrogen, 2-oxaalkyl, 2-oxacycloalkyl or a monovalent acyl Ac^1 derived from formic acid, a lower alkyl hemiester of carbonic acid or from an acyclic or aromatic carboxylic acid containing not more than 18 carbon atoms, or any two of the

symbols R^a, R^b and R^c together represent carbonyl, lower alkylidene or monocyclic cycloalkylidene, X represents cyano or a group of the formula —C(=O)Z, in which Z represents hydrogen, hydroxy, amino, hydrazino, phenyl, lower alkyl, lower alkoxy or phenyl-lower alkoxy, whereby the phenyl ring can be substituted with nitro, methoxy, methyl or halogen, Y represents hydrogen or has one of the meanings assigned to X, and n is 0 or 1, and a salt of a compound, in which Z is hydroxy, with an alkaline metal, an alkaline-earth metal, ammonia or an organic amine.

4,145,345
CHROMATOGRAPHIC PURIFICATION OF MAYTANSINE

George L. Beemsterboer, Dayton, and Joseph Satanek, Jr., Xenia, both of Ohio, assignors to Research Corporation, New York, N.Y.

Filed Dec. 7, 1977, Ser. No. 858,450
Int. Cl.² C07D *413/14*
U.S. Cl. 260—239.3 T **7 Claims**

1. In a method of isolating maytansine, from woody material containing same, which comprises, using as starting material, an extract from the aforesaid sources which is soluble in 95% aqueous ethanol and ethyl acetate and insoluble in 5% aqueous sodium hydroxide and in 2N aqueous hydrohloric acid, acylating said material and isolating the fraction thereof which is soluble in 20%–35% aqueous methanol and in chloroform, but insoluble in carbon tetrachloride,

the steps which comprise subjecting said fraction to

(a) chromatography on silica gel of mesh 100 to 1,000 in methylene chloride,

(b) eluting with methylene chloride followed by a more polar solvent consisting of methylene chloride containing 1%–10% by volume of a member selected from the group consisting of lower alkanols, lower alkyl ketones, and lower alkyl lower alkanoids wherein the lower alk group contains 1–5 carbon atoms,

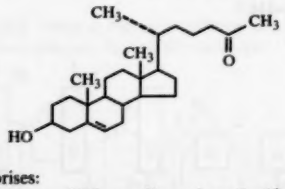
(c) preserving the eluate fractions from said more poiar solvent and removing said solvent therefrom to provide a residue of substantially pure maytansine.

4,145,346
PREPARATION OF 3β-HYDROXY-27-NORCHOLEST-5-ENE-25-ONE AND INTERMEDIATES THEREOF

Howard Jones, Holmdel, and Robert A. Frankshun, Kenilworth, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 3, 1977, Ser. No. 838,601
Int. Cl.² C07J *9/00*
U.S. Cl. 260—239.55 C **5 Claims**

1. A process for preparing 3β-hydroxy 27-norcholest-5-ene-25-one of the formula:



which comprises:

(a) ozonizing a 3β-loweralkanoyloxy-5α,6β-dibromo-24-ethylcholest-22-ene at −70° C. to −80° C. and reducing in situ with zinc dust and acidic acid the ozonide so formed to produce 3β-loweralkanoyloxy-27-hexanorcholest-5-en-20β-carboxaldehyde;

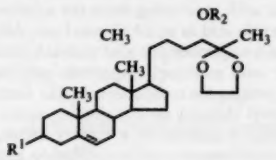
(b) alkylating 3β-loweralkanoyloxy-27-hexanorcholest-5-en-20β-carboxaldehyde with 2-(1,3-dioxolane-2-methyl)-ethyl bromide at −20° C. to −40° C. to produce 25-dioxalanyl-22-hydroxy-27-norcholest-5en-3β-alkanoate;

(c) treating 25-dioxalanyl-22-hydroxy-27-norcholest-5-en-3β-alkanoate with methyl sulfonyl chloride to produce 22-methane sulfonate of 25-dioxalanyl-22-hydroxy-27-norcholest-5-en-3β-alkanoate;

(d) reducing the 22-methane sulfonate with lithium aluminum hydride and refluxing said mixture followed by cooling to 0° C. to 10° C. to produce 3β-hydroxy-25-dioxalanyl-27-norcholest-5-ene; and

(e) treating the 25-dioxalanyl compound with dilute acids to produce 3β-hydroxy-27-norcholest-5-en-25-one.

2. A compound of the structural formula:



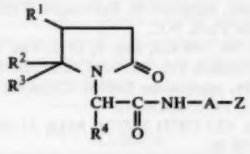
wherein R^1 is loweralkanoyloxy; R^2 is hydrogen or mesyl.

4,145,347
N-(SUBSTITUTED-AMINOALKYL)-2-oxo-1-PYRROLIDINEACETAMIDES

Yvon J. L'Italien, Plymouth, and Ivan C. Nordin, Ann Arbor, both of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 773,877, Mar. 3, 1977, abandoned. This application Mar. 7, 1978, Ser. No. 884,464
Int. Cl.² C07D *207/26*
U.S. Cl. 546—208 **12 Claims**

1. A compound of the formula



and acid addition salts thereof, wherein R^1 is hydrogen or phenyl, R^2, R^3 and R^4 are hydrogen or methyl, A is an alkylene chain having two, three or four carbon atoms which is optionally substituted with one or two methyl or ethyl groups and Z is di(lower alkyl)amino, 4-morpholinyl, 4-(lower alkyl)-1-piperazinyl or (lower alkyl)$_n$-piperidinyl where n is an integer from zero to six with the proviso that when R^1 is phenyl, R^2 and R^3 are hydrogen.

3. The compound of claim 1 having the name cis-N-[2-(2,6-dimethyl-1-piperidinyl)ethyl]-2-oxo-1-pyrrolidineacetamide and acid addition salts thereof.

4,145,348
2-[[5-(4-CHLOROPHENYL)FURFURYLAMINO]METHYL]PYRIDINE DIHYDROCHLORIDE

Stanford S. Pelosi, Jr., and Chia-Nien Yu, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 10, 1978, Ser. No. 922,861
Int. Cl.² C07D *491/02*
U.S. Cl. 546—283 **2 Claims**

1. The compound 2-[[5-(4-chlorophenyl)furfurylamino]methyl]pyridine dihydrochloride.

4,145,349

PROCESS FOR THE PRODUCTION OF SACCHARINE

Anthony J. Bebbington, Toronto, Canada, assignor to Commercial Organics Limited, Montreal, Canada

Filed Dec. 19, 1977, Ser. No. 862,220
Int. Cl.[2] C07D 277/64
U.S. Cl. 260—301 3 Claims

1. In the method of producing saccharine comprising the steps of sulfonating o-chlorobenzoic acid with sodium sulfite in aqueous solution in the presence of a copper salt to produce o-sulfobenzoic acid, recovering from the solution and drying the o-sulfobenzoic acid as an alkali metal salt, dehydrating the salt to provide o-sulphobenzoic acid endoanhydride and reacting the latter with methanol to provide o-sulfobenzoic acid methyl ester, treating the o-sulfobenzoic acid methyl ester with excess of thionyl chloride as, chlorinating agent, in the presence of a catalytic amount of a tertiary amide, to provide methoxycarbonylbenzene-o-sulfonyl chloride, and reacting the latter compound with ammonium hydroxide and then acidifying to provide saccharine,

the improvement comprising, in combination, salting out substantially the whole of the o-sulphobenzoic acid from the solution of its salt in the form of potassium o-carboxybenzene sulfonate by the addition of hydrochloric acid and potassium chloride, removing the inorganic salt formed during dehydration of the potassium salt prior to chlorination of the o-sulfobenzoic acid methyl ester, and using no more than a twofold excess of the chlorinating agent.

4,145,350

CYCLIC SULPHUR COMPOUNDS TRIAZOLYL SUBSTITUTED PHENOXATHIN 10, 10 DIOXIDES

Harold F. Hodson, Hayes, and John F. Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 394,424, Sep. 5, 1973, Pat. No. 4,025,635. This application Feb. 22, 1977, Ser. No. 770,841
Claims priority, application United Kingdom, May 4, 1973, 21174/73; Sep. 6, 1972, 41429/72
Int. Cl.[2] C07D 257/04; A61K 31/39
U.S. Cl. 260—308 D 2 Claims

1. 2-(5-tetrazolyl) phenoxathiin-10, 10-dioxide or a pharmaceutically acceptable alkali metal salt thereof.

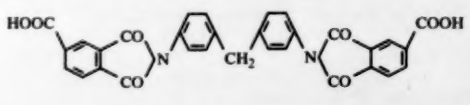
4,145,351

DIIMIDODICARBOXYLIC ACIDS

Karl Schmidt; Ferdinand Hansch, and Hans-Malte Rombrecht, all of Hamburg, Germany, assignors to Dr. Beck & Co. AG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 489,026, Jul. 16, 1974, abandoned, which is a continuation of Ser. No. 215,100, Jan. 3, 1972, abandoned, which is a division of Ser. No. 659,234, Aug. 8, 1967, Pat. No. 3,697,471, which is a continuation of Ser. No. 238,315, Nov. 2, 1962, abandoned. This application Jun. 11, 1976, Ser. No. 695,503
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1961, 1268654; Dec. 12, 1961, 1445263; Jul. 6, 1962, 1495100
Int. Cl.[2] C07D 209/40; C08L 79/08
U.S. Cl. 260—326 N 4 Claims

1. Diimidodicarboxylic acid of the following formula:



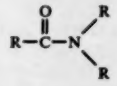
4,145,352

PREPARATION OF THIOAMIDES FROM AMIDES

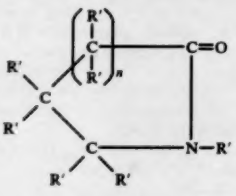
Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1977, Ser. No. 838,343
Int. Cl.[2] C07C 153/057, 153/063; C07D 205/06, 207/24
U.S. Cl. 260—326.82 10 Claims

1. A method for preparing thioamides from amides comprising contacting an amide chosen from acyclic compounds of the formula



wherein each R is selected from the group consisting of hydrogen, alkyl and cycloalkyl radicals, and mixtures thereof and cyclic compounds of the formula



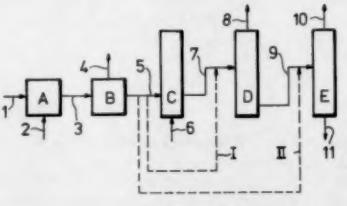
wherein each R' is selected from the group consisting of hydrogen, alkyl and cycloalkyl radicals and mixtures thereof and n is 0 to 10 with a source of sulfur in the presence of a sulfactive catalyst comprising molybdenum or tungsten at an elevated temperature in a range of about 300° to about 800° F. (149°–427° C.).

4,145,353

PROCESS FOR REMOVING 1,4-NAPHTHOQUINONE FROM PHTHALIC ANHYDRIDE

Norbert Schenk, Leverkusen; Paul Losacker, Leichlingen, and Manfred Martin, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,516
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654405
Int. Cl.[2] C07D 307/89
U.S. Cl. 260—346.7 14 Claims



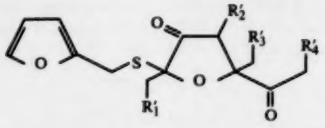
1. Process for removing 1,4-naphthoquinone from phthalic anhydride which comprises subjecting phthalic anhydride-containing 1,4-naphthoquinone, or mixtures containing phthalic anhydride and also containing 1,4-naphthoquinone, to a heat treatment at temperatures from about 200° to 300° C. in the presence of 1,4,4a,9a-tetrahydroanthraquinone.

4,145,354
PROCESS FOR PREPARING 5-ACYL-2-(FURFURYLTHIO)DIHYDRO-2,5-DIALKYL-3-[2H]FURANONES

Braja D. Mookherjee, Holmdel; Donald A. Withycombe, Lincroft; Ira Katz, West Long Branch, all of N.J.; Alfred E. Goossens, New York, N.Y.; Manfred H. Vock, Locust, N.J.; William J. Evers, Middletown, N.J.; Joaquin F. Vinals, Red Bank, N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

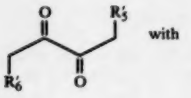
Division of Ser. No. 819,957, Jul. 28, 1977, Pat. No. 4,092,334.
This application Mar. 17, 1978, Ser. No. 887,637
Int. Cl.[2] C07D *307/64*
U.S. Cl. 260—347.2 1 Claim

1. A process for preparing at least one 5-acyl-2-(furfurylthio)dihydro-2,5-dialkyl-3-[2H]furanone having the structure:



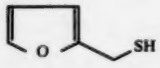
wherein R_1', R_2', R_3' and R_4' are the same or different and each represents hydrogen or methyl comprising the steps of

(i) First reacting an alpha, beta diketone having the structure:

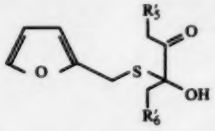


with

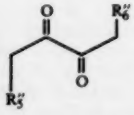
furfuryl mercaptan having the structure:



thus forming an addition product having the structure:



(ii) and then reacting the said addition product with an alpha, beta diketone having the structure:

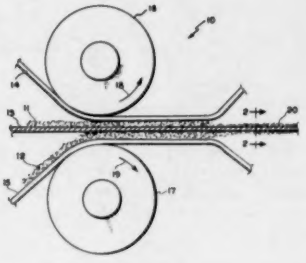


thereby forming said 5-acyl-(furfurylthio) dihydro-2,5-dialkyl-3-[2H]furanone wherein R_5' and R_6' are the same or different and each represents methyl or hydrogen; and wherein R_5'' and R_6'' are the same or different and each represents hydrogen or methyl; and wherein the number of methyl groups constituting R_1', R_2', R_3' and R_4' is the same as the number of methyl groups constituting R_5', R_6', R_5'' and R_6''.

4,145,355
PROCESS FOR PRODUCING ETHYLENE OXIDE

Paolo D. Porta; Angelo Cantaluppi; Bruno Ferrario, and Paolo Montalenti, all of Milan, Italy, assignors to SAES Getters S.p.A., Milan, Italy

Division of Ser. No. 249,772, May 3, 1972, Pat. No. 3,856,709.
This application Aug. 28, 1974, Ser. No. 501,205
Claims priority, application Italy, Apr. 29, 1972, 23727 A/72
Int. Cl.[2] C07D *301/10*
U.S. Cl. 260—348.34 1 Claim



1. A process for producing ethylene oxide by exposing a mixture of ethylene and oxygen to a catalytic structure comprising:

A. an aluminum substrate 0.010 inches thick and having a Vickers hardness of 90 kg/mm^2,

B. hard particles of alumina of a size which passes through a screen of 100 mesh per inch and are retained on a screen of 600 mesh per inch wherein the hard particles have a Vickers hardness of 200 to 800 kg/mm^2 and the hard particles are embedded in the substrate,

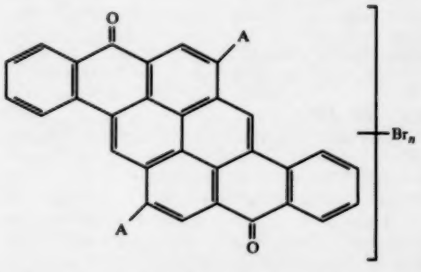
C. soft particles of catalytic silver which are softer than the hard particles and are softer than the substrate in a mixture with the hard particles of alumina and of a size such that they pass through a screen of 400 mesh per inch and wherein the weight ratio of alumina to silver is 3:7 and the soft particles in the mixture are adhered substantially completely to the substrate.

4,145,356
PROCESS OF PREPARING PYRANTHRONE PIGMENTS

Fritz Graser, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jan. 17, 1978, Ser. No. 870,097
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2702985
Int. Cl.[2] C09B *3/44*
U.S. Cl. 260—360 12 Claims

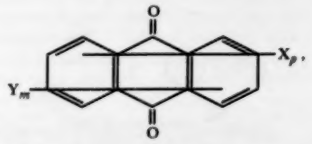
1. A process for the production of pyrnathrone pigments of the formula:



wherein n may be 0 or 1, wherein when n is 0, each A is hydro-

gen or chlorine, and when n is 1, each A is chlorine, which comprises:

crystallizing a finely divided crude pigment of the above formula, obtained by milling or dissolving a crude pigment of the above formula in sulfuric acid and then precipitating said dissolved pigment, in at least one polar organic solvent in the presence of from 0.5 to 10% by weight, based on the pyranthrone compound, of at least one anthraquinone compound of the formula:



wherein X is chlorine, Y is alkyl of 1 to 4 carbon atoms, hydroxyl, carboxyl, carbo-alkoxy, wherein alkoxy is of 1 to 4 carbon atoms, or carbophenoxy, p is 0, 1 or 2 and m is 0, 1 or 2.

4,145,357

STEROID DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Kiyoshige Ochi, Kawagoe; Isao Matsunaga; Minoru Shindo, both of Tokyo, and Chikara Kaneko, Kanazawa, all of Japan, assignors to Chugai Syiyaku Kabushiki Kaisha, Tokyo, Japan

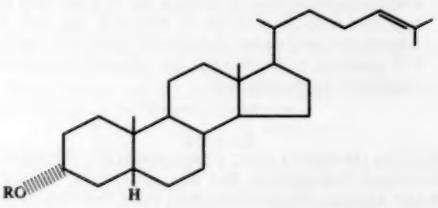
Filed Nov. 28, 1977, Ser. No. 855,362

Claims priority, application Japan, Dec. 8, 1976, 51-146571

Int. Cl.² C07J 9/00

U.S. Cl. 260—397.2 **14 Claims**

1. A steroid compound represented by the formula



wherein R is hydrogen, acyl, triarylmethyl, methoxymethyl, tetrahydropyranyl or benzyl.

4,145,358

PREPARATION OF ORGANOPHOSPHORUS NICKEL COMPLEXES

Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 684,350, May 7, 1976, Pat. No. 4,118,408. This application Dec. 8, 1977, Ser. No. 858,595

Int. Cl.² C07F 15/04

U.S. Cl. 260—439 R **4 Claims**

1. A process of preparing bis(μ-diphenylphosphido)tris(triethylphosphine)dinickel comprising reacting suitable amounts of trans-dichlorobis(triethylphosphine)nickel(II) with lithium diphenylphosphide etherate in a suitable diluent under suitable reaction conditions to yield a reaction product, then reacting said reaction product in a suitable diluent with a suitable amount of tetrakis(triethylphosphine)nickel(0) under suitable reaction conditions, wherein all reactions are conducted under an inert atmosphere.

4,145,359

SHORT CHAIN LINEAR AMIDOSILOXANES

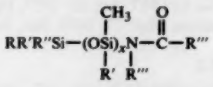
Gary R. Homan, Midland, Mich., and Louis H. Toporcer, Twinsburg, Ohio, assignors to Dow Corning Corporation, Midland, Mich.

Filed May 8, 1978, Ser. No. 904,177

Int. Cl.² C07F 7/10

U.S. Cl. 260—448.2 N **10 Claims**

1. An amidosiloxane of the formula



where R is a methyl, ethyl, or phenyl radical; R′ is a methyl, ethyl, or 2-(perfluoroalkyl) ethyl radical in which the perfluoroalkyl radical contains 1 to 4 carbon atoms inclusive; R″ is a methyl or vinyl radical; R‴ is a methyl or ethyl radical; and x is an integer of from 3 to 20.

4,145,360

PRODUCTION OF ISOCYANATES

John Crosby, and John A. Milner, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, United Kingdom

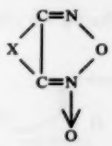
Filed Mar. 28, 1977, Ser. No. 781,869

Claims priority, application United Kingdom, Apr. 1, 1976, 13302/76

Int. Cl.² C07C 118/00; C07D 273/00

U.S. Cl. 260—453 P **5 Claims**

1. A process for the production of an organic isocyanate comprising heating a furoxan having the formula:



wherein X is an acyclic or cyclic divalent group which is free from substituents which are reactive with vicinal diketones in the presence of a molar excess of a vicinal diketo-compound having the formula:

wherein Y and Z are organic groups which are free of substitutents which are reactive with said furoxan.

4,145,361

2-FLUORO-2,2-DINITROETHYL/SUBSTITUTED ARYL CARBONATES AND PROCESS FOR THEIR PREPARATION

Alain G. Becuwe, Mennecy, and Claude M. Ucciani, Vert le Petit, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris Cedex, France

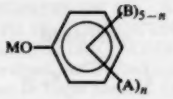
Filed Dec. 8, 1977, Ser. No. 858,688

Claims priority, application France, Dec. 30, 1976, 76 39521

Int. Cl.² C07C 69/96

U.S. Cl. 260—463 **5 Claims**

1. Process for the synthesis of mixed carbonates of 2-fluoro-2,2-dinitroethyl and of an aryl substituted at least by electron-attracting groups, wherein 2-fluoro-2,2-dinitroethyl chloroformate is reacted with an alkali metal phenate of the formula



in which M = Na or K, B is hydrogen or methyl and A is nitro or trifluoromethyl, n is an integer number between 2 and 4, at between 10° and 50° C.in an anhydrous aprotic polar solvent medium.

4,145,362

PROCESS FOR THE ARYLATION OF OLEFINES

Joseph R. Brepoels, Beverloo, and Jean-Marie Vaneghem, Balen, both of Belgium, assignors to S.A. P R B en Neerlandais PRB N.V., Brussels, Belgium

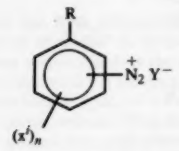
Continuation of Ser. No. 345,197, Mar. 26, 2973, abandoned, which is a continuation-in-part of Ser. No. 26,742, Apr. 8, 1970, abandoned. This application May 10, 1977, Ser. No. 795,544

Claims priority, application Belgium, Apr. 10, 1969, 731359; Nov. 13, 1969, 741640; Mar. 31, 1970, 87126

Int. Cl.[2] C07C *25/14, 47/55, 49/80, 121/66*

U.S. Cl. 260—465 G **12 Claims**

1. A process for the haloarylation of an olefinic compound by addition of an aryl group and a halo group to a double bond of said olefinic compound which consists essentially of the steps of reacting an arylamine with sodium nitrite in an aqueous acidic solution consisting essentially of a halohydric acid and a lower alkanoic acid at about 0° C. to 4° C. to form a solution of an aryldiazonium halide and reacting said aryldiazonium halide solution with an olefinic compound in acetone as a solvent at a temperature of about 0° to 40° C. in the presence of a catalytically effective amount of a copper halide, wherein the amount of alkanoic acid is about 15 to 37% by volume of the total solvents used and the arylation reaction begins at a pH = 0 to 1, wherein the aryldiazonium halide has the formula:



wherein R is a hydrogen atom or a lower alkyl, trifluoromethyl, hydroxy, lower alkoxy, lower alkylthio or di-(lower alkyl)-amino group or a phenyl, phenoxy or phenylthio group, in which the phenyl nucleus may be substituted by halogen, CF_3, NO_2, CN, COOH or $—CH_2—CHCl—CN$;

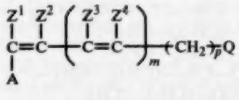
X^i is a hydrogen or a halogen atom, a lower alkyl, nitro, cyano or carboxy group, or

R and X^i together denote a tri-atomic or tetra-atomic chain which may or may not be saturated and which together with the phenyl nucleus form a bicyclic radical of the naphthalene or benzoheterocyclic series,

Y^- is a halide ion and

n is a whole number from 1 to 4,

and wherein the olefinic compound has the formula



wherein Z^1, Z^2, Z^3 and Z^4 which may be the same or different are each a hydrogen or halogen atom or a lower alkyl radical.

A is a hydrogen atom or a lower alkyl radical,

Q is a hydrogen or halogen atom or a cyano, nitro, hydroxy or trifluoromethyl group or a heterocyclic radical or an alkyl, epoxyalkyl, alkoxy, alkenoxy, alkylsulfonyl, alkenylsulfonyl, alkylamino, alkenylamino, or carbalkoxy wherein any alkyl or alkenyl chain may be substituted by halogen, hydroxy or carboxy; aryl, aryloxy, or aryloxycarbonyl in which the aryl radical may be substituted by halogen, trifluoromethyl, alkyl, alkoxy, alkenyloxy, nitro or carboxy groups; or an acyl, acyloxy, cycloalkyl or cycloalkenyl group;

m is 0 or 1 and

p is 0, 1 or 2.

4,145,363

4-CARBAMOYLAMINO-α-AMINOMETHYLBENZYL ALCOHOL DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo; Kiyoshi Murase, Urawa; Toshiyasu Mase, Tokyo; Hisashi Ida, Urawa, and Toichi Takenaka, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

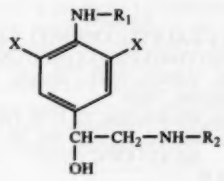
Division of Ser. No. 651,738, Jan. 23, 1976, Pat. No. 4,063,025. This application Jun. 27, 1977, Ser. No. 809,998

Claims priority, application Japan, Feb. 5, 1975, 50-14993; May 24, 1975, 50-62207; Dec. 26, 1975, 50-157348

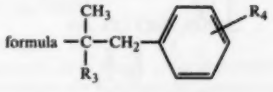
Int. Cl.[2] C07C *127/17*; A61K *31/17*

U.S. Cl. 260—553 A **3 Claims**

1. A 4-substituted amino-α-aminomethylbenzyl alcohol derivative represented by the formula:



wherein X represents a halogen atom; R_1 represents a carbamoyl group, a mono- or dilower alkyl substituted carbamoyl group or a phenyl substituted carbamoyl group; and R_2 represents a lower alkyl group, a cycloalkyl group, or a group shown by the



wherein R_3 represents a hydrogen atom or a lower alkyl group and R_4 represents a hydrogen atom, a hydroxy group or a lower alkoxy group and the pharmaceutically acceptable non-toxic salts thereof.

4,145,364

PREPARATION OF FLUORINATED ANILINES

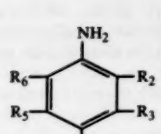
Dennis M. Mulvey, Milford, and Leonard M. Weinstock, Bellemead, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 30, 1977, Ser. No. 855,649

Int. Cl.[2] C07C *85/11*

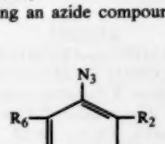
U.S. Cl. 260—578 **23 Claims**

1. A method of preparing fluorinated anilines of structural formula:



where R_2, R_3, R_5, and R_6 may be the same or different and are independently selected from hydrogen, C_{1-6} alkyl, C_{1-16} alkenyl, halo, halo C_{1-4} alkyl, C_{1-6} alkoxy, C_{1-4} alkoxycarbonyl, acyloxy, acyl, C_{1-4} alkylthio, hydroxy C_{1-4} alkyl, hydroxy, amino, cyano, and nitro;

comprising reacting an azide compound of structural formula:



where R_2, R_3, R_5, and R_6 have the same meaning as above, with hydrogen fluoride under essentially anhydrous conditions.

4,145,365

2-DECARBOXY-2-ALKYLCARBONYL-9-DEOXY-9,10-DIDEHYDRO-PGD COMPOUNDS

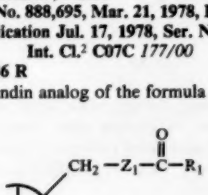
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 888,695, Mar. 21, 1978, Pat. No. 4,123,463. This application Jul. 17, 1978, Ser. No. 925,255

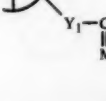
Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 260—586 R **47 Claims**

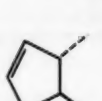
1. A prostaglandin analog of the formula



wherein D is



, or

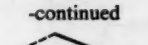


;

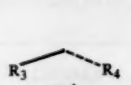
wherein R_1 is alkyl of one to 4 carbon atoms, inclusive;

wherein L_1 is

-continued

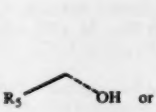


a mixture of



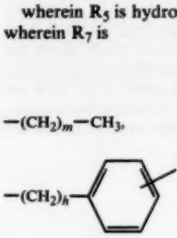
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;

wherein M_1 is



wherein R_5 is hydrogen or methyl;

wherein R_7 is



(1)

(2)

(3)

wherein h is zero to three, inclusive,

wherein m is one to 5, inclusive, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms, the variout T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein Y_1 is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) $—CH_2CH_2—$, or

(4) —C≡C—; and

wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,

(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,

(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,

(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,

(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,

(7) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—,

(8) —$(CH_2)_3$—O—$(CH_2)_g$—,

(9) —C≡C—CH_2—$(CH_2)_g$—CH_2—,

(10) —CH_2—C≡C—$(CH_2)_g$—CH_2—, or

(11) trans—$(CH_2)_2$—$(CH_2)_g$—CH=CH—,

wherein g is one, two, or three.

4,145,366

PROCESS FOR ISOMERIZING ONE OF THE GEOMETRIC ISOMERS OF AN α,β-UNSATURATED ALDEHYDE TO ITS CORRESPONDING OTHER GEOMETRIC ISOMER

Yataro Ichikawa, Iwakuni, and Teizo Yamaji, Yamaguchi, both of Japan, assignors to Teijin Limited, Osaka, Japan

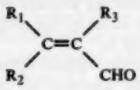
Continuation of Ser. No. 633,083, Nov. 18, 1975, abandoned. This application Oct. 18, 1977, Ser. No. 843,341

Claims priority, application Japan, Nov. 18, 1974, 49-131989; Nov. 18, 1974, 49-131990

Int. Cl.[2] C07C 47/20

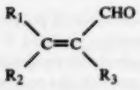
U.S. Cl. 260—601 R 16 Claims

1. A process for isomerizing one of the geometric isomers of an α,β-unsaturated aldehyde to the corresponding other geometric isomer, which comprises heating an α,β-unsaturated aldehyde of the formula



(1-A)

or



(1-B)

wherein

R_1 is alkyl of 1 to 30 carbon atoms or alkenyl of 2 to 30 carbon atoms, and

R_2 and R_3, independently of each other, are hydrogen or alkyl of 1 to 5 carbon atoms,

each of said alkyl and alkenyl represented by R_1, R_2 and R_3, independently of one another, being unsubstituted or substituted by 1 to 3 substituents selected from the group consisting of alkoxy of 1 to 5 carbon atoms, alkoxycarbonyl of 2 to 6 carbon atoms, fluorine, chloride and bromine,

with the proviso that R_2 is different from R_1,

at a temperature of 30 to 400° C. in the presence of an inert organic solvent which dissolves the α,β-unsaturated aldehyde or is miscible with the aldehyde, and in the presence of (1) a catalyst having a pKa of 1 to 7, which is soluble in the reaction system, selected from the group consisting of hydrofluoric acid, nitrous acid, chromic acid, selenic acid, telluric acid, hypophosphorous acid, phosphorous acid, phosphoric acid, a partial ester of one of said acids which are polybasic, an organic carboxylic acid of 1 to 10 carbon atoms, and a partial ester of one of said organic carboxylic acids which are polybasic, or (2) as catalyst, a cation-exchange resin having a carboxyl group as an acid site and having a pKa of 1 to 7.

10. A process for isomerizing one of the geometric isomers of an α,β-unsaturated aldehyde to the corresponding other geometric isomer, which comprises heating an α,β-unsaturated aldehyde selected from the group consisting of 2-methy-3-furyl-acrolein, 2-ethyl-3-furyl-acrolein, 2-propyl-furyl-acrolein, 3-methyl-4-furylidene-butyraldehyde and 5-(2-furyl)-3-methyl-2-pentenal, at a temperature of 30° to 400° C. in the presence of an inert organic solvent which dissolves the α,β-unsaturated aldehyde or is miscible with the aldehyde, and in the presence of (1) a catalyst having a pKa of 1 to 7, which is soluble in the reaction system, selected from the group consisting of hydrofluoric acid, nitrous acid, chromic acid, selenic acid, telluric acid, hypophosphorous acid, phosphorous acid, phosphoric acid, a partial ester of one of said acids which are polybasic, an organic carboxylic acid of 1 to 10 carbon atoms, and a partial ester of one of said organic carboxylic acids which are polybasic, or (2) as catalyst, a cation-exchange resin having a carboxyl group as an acid site and having a pKa of 1 to 7.

4,145,367

PROCESS FOR PURIFYING 1,2-DICHLOROETHANE

Theodore S. Boozalis, and John B. Ivy, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 6, 1975, Ser. No. 547,521

Int. Cl.[2] C07C 21/02

U.S. Cl. 260—652 P 4 Claims

1. In a method for removing impurities from a recycle stream from a dehydrochlorination of ethylene dichloride to vinyl chloride, the improvement which comprises hydrogenating over a palladium hydrogenation catalyst at least a part of said recycle stream and distilling from said hydrogenated portion the compounds boiling below about 70° C., said palladium hydrogenation catalyst consisting essentially of from 0.01 to 5 weight percent palladium on an inert support, said hydrogenation being carried out at a temperature of from about 0° C. to below about 250° C., said hydrogen being supplied in an amount at least theoretically sufficient to hydrogenate all the unsaturated impurities.

4,145,368

PROCESS FOR THE PRODUCTION OF 1,1,1-TRIFLUORO-2,2-DICHLOROETHANE

Richard F. Sweeney, Elma, and Bernard Sukornick, Williamsville, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 20, 1977, Ser. No. 843,759

Int. Cl.[2] C07C 19/08

U.S. Cl. 260—653 21 Claims

1. A process for producing 1,1,1-trifluoro-2,2-dichloroethane comprising chlorinating 1,1,1-trifluoro-2-chloroethane with Cl_2, recovering product 1,1,1-trifluoro-2,2-dichlorethane from the reaction mixture, reacting in the vapor phase over-chlorinated byproduct 1,1,1-trifluoro-2,2,2-trichloroethane in the reaction mixture with additional 1,1,1-trifluoro-2-chloroethane in the presence of a catalyst selected from the group consisting of chromium oxides and oxyfluorides and activated carbon and recovering additional 1,1,1-trifluoro-2,2-dichloroethane from the catalyst reaction mixture.

4,145,369

FLAME-RETARDANT EPOXY RESIN COMPOSITIONS

Yasuo Hira, Fujisawa; Ryoichi Sudo, Yokosuka; Issei Takemoto, Yokohama, and Tokio Isogai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 19, 1977, Ser. No. 834,457

Claims priority, application Japan, Sep. 20, 1976, 51/111870; Sep. 2, 1977, 52/104958

Int. Cl.[2] C08L 63/00

U.S. Cl. 260—831 22 Claims

1. A flame-retardant epoxy resin composition comprising 100 parts by weight of a polyepoxide containing more than one epoxy group in its molecule, 0.8 to 1.2 equivalents of an acid anhydride curing agent per equivalent of the polyepoxide, 0.5 to 5 parts by weight of an imidazole curing agent per 100 parts by weight of said polyepoxide, and amounts of aluminum trihydrate powder and at least one member selected from the group consisting of red phosphorus powder and red phosphorus powder coated by a thermo-setting resin within the range surrounded by connecting the points A, B, C, D, E, F, G, H and I as described below per 100 parts by weight of said polyepoxide, wherein the points A, B, C, D, E, F, G, H and I each represent the following compositions:

	Aluminum trihydrate powder (parts by weight)	Red phosphorus powder or red phosphorus powder coated by a thermo-setting resin (parts by weight)
A	72	50
B	83	20

-continued

	Aluminum trihydrate powder (parts by weight)	Red phosphorus powder or red phosphorus powder coated by a thermo-setting resin (parts by weight)
C	103	10
D	160	5
E	220	4
F	198	20
G	178	31
H	154	40
I	112	46

4,145,370

POWDERED COATING COMPOSITION OF CARBOXYL TERMINATED POLYESTER, EPOXY RESIN AND ZINC OXIDE

John E. Sreeves, Solihull, England, assignor to British Industrial Plastics, Ltd., Manchester, England

Filed Sep. 27, 1977, Ser. No. 837,621

Claims priority, application United Kingdom, Sep. 27, 1976, 40068/76

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—835 7 Claims

1. A powder coating composition comprising a carboxyl terminated polyester resin having a carboxyl functionality of at least 2, an epoxy resin which is at least di-functional with respect to epoxy groups, and zinc oxide, the amounts of carboxyl terminated polyester and epoxy resin being such that the ratio of functional epoxy groups to carboxyl groups on a chemical equivalent basis is in the range 0.5:1.0 up to 3.0:1.0 and the amount of zinc oxide in the composition being at least 1% by weight based on the total weight of polyester and epoxy resins.

4,145,371

FLAME-RETARDANT FIBER HAVING AN EXCELLENT COLOR-FASTNESS AND PREPARATIVE METHOD THEREOF

Shunroku Tohyama; Yutaka Masuda, and Tatsuo Nogi, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 24, 1977, Ser. No. 800,000

Claims priority, application Japan, Oct. 1, 1976, 51-117261

Int. Cl.[2] C08L *29/04, 61/34, 61/24;* C08G *12/38*

U.S. Cl. 260—856 3 Claims

1. A flame retardant fiber comprising (A) about 30 to 60 parts by weight of an amino resin, said amino resin consisting of a condensate of formaldehyde with an amino compound mixture consisting of melamine, urea and dicyandiamide in proportions satisfying the following relations (1) and (2):

$$0.02 \leqq \frac{D}{M + U + D} \leqq 0.5 \quad (1)$$

and

$$0.3 \leqq \frac{M}{M + U} \leqq 0.85 \quad (2)$$

wherein M is the number of moles of melamine, U is the number of moles of urea, and D is the number of moles of dicyandiamide, said amino resin containing at least 50% by mole of methylene linkages based on the amount of formaldehyde used; and (B) about 70 to 40 parts by weight of polyvinyl alcohol.

4,145,372

PROCESS FOR PREPARING MOLDABLE POLYAMIDE POLYESTER COMPOSITIONS

Christopher L. Murray, Warley, and Corwyn P. Vale, Brierley Hill, both of England, assignors to British Industrial Plastics, Ltd., Manchester, United Kingdom

Filed Jun. 20, 1977, Ser. No. 808,041

Claims priority, application United Kingdom, Jun. 23, 1976, 26105/76

Int. Cl.[2] C08L *77/00*

U.S. Cl. 260—857 PE 13 Claims

1. A process for the production of a moldable thermoplastic composition from a polyamide which contains free amine groups and is of softening point in the range 210° to 270° C. and of number average molecular weight in the range 10,000 to 30,000, comprising heating a mixture comprising from 50 to 99% by weight of said polyamide and from 50 to 1% by weight of a polyester which is of number average molecular weight less than 10,000 and of acid value in the range 30 to 90, said polyester being one produced by

(a) condensing an aromatic or aliphatic dibasic acid or anhydride with a carboxylic aliphatic di- or poly-hydroxy compound, to produce a hydroxy-terminated polyester intermediate, and

(b) reacting said hydroxy-terminated polyester intermediate with an acid which contains at least 3 carboxylic acid groups, or with an anhydride thereof, which is employed in a quantity such as to provide the polyester with an acid value in the range 30 to 90 and with a softening point of at least 100° C., heating of said mixture comprising polyamide and polyester being carried out at a temperature of at least 170° C. whereby water is produced by reaction between the polyamide and polyester and is allowed to escape from said mixture.

4,145,373

STRESS CRACK RESISTANT POLYCARBONATES

Arthur L. Baron, and Parameswar Sivaramakrishnan, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Feb. 9, 1976, Ser. No. 656,490

Int. Cl.[2] C08L *69/00*

U.S. Cl. 260—873 4 Claims

1. A polycarbonate comprising an intimate admixture of a polycarbonate resin and 0.25 to 0.75 parts by weight of an ethylene-vinylacetate copolymer containing 17 to 40% by weight of polymerized vinylacetate units therein per 100 parts of said polycarbonate resin.

4,145,374

HIGH CLARITY BLENDS OF POLYCARBONATES WITH MERCAPTAN-MODIFIED GRAFT POLYMERS

Kenneth W. Narducy, Bloomingdale; John C. Falk, Chicago, both of Ill., and Murray S. Cohen, Convent Station, N.J., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 27, 1977, Ser. No. 846,001

Int. Cl.[2] C08L *67/06*

U.S. Cl. 260—873 3 Claims

1. A composition comprising a blend of:

A. 90 to 97 weight percent of the polycarbonate of a di-(monohydroxyphenyl)-substituted aliphatic hydrocarbon, and

B. 10 to 3 weight percent of a graft polymer prepared by polymerizing from 50 to 10% wt of mixture of styrene and methyl methacrylate in the ratio of from 1:1 to 1:3 in the presence of from 50 to 90 wt % of a rubbery substrate selected from the group consisting of polybutadiene and styrene butadiene copolymers containing up to 40 wt % styrene, said graft polymer having incorporated therein from about 50 to about 90% of the theoretical amount based on ethylenic unsaturation of a phenalkyl mercaptan.

4,145,375

MAKING STYRENE/MALEIC ANHYDRIDE COPOLYMERS BY SUSPENSION POLYMERIZATION

Louis A. Cutter, Pittsburgh, Pa., and Robert E. Nunn, Marion, Ohio, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1978, Ser. No. 881,347
Int. Cl.[2] C08L *25/04*
U.S. Cl. 260—874 3 Claims

1. Method of making a mixture of polystyrene and a copolymer of styrene and maleic anhydride comprising (a) mixing together under mass polymerization conditions styrene and maleic anhydride in a ratio of at least 5:1 and at rates such that maleic anhydride is not added at a rate greater than the rate at which the styrene polymerizes under the current polymerization conditions, until about 25% to about 40% of the monomers are polymerized, to produce a reaction mass containing polymerized maleic anhydride in an amount comprising from about 1% to about 10% of the total reaction mass, (b) suspending the reaction mass in water, adjusting the pH of the suspension to between about 4.5 and about 7.0, and carrying the styrene polymerization reaction to completion with the aid of a free-radical initiator to form beads of polymer product.

4,145,376

HIGH IMPACT POLYSTYRENE COMPOSITION

William J. I. Bracke, Hamme; Jean N. M. Bertrand, Tervuren, and Jacques T. L. Zegers, Brussels, all of Belgium, assignors to Labofina S. A., Brussels, Belgium

Filed Oct. 20, 1976, Ser. No. 734,002
Int. Cl.[2] C08L *53/02*
U.S. Cl. 260—876 B 6 Claims

1. A composition consisting essentially of a mixture of a styrene polymer, a rubbery dienic polymer and a sequenced copolymer of styrene and a diene, the total styrene polymer content which includes the free polystyrene and the polystyrene present in the sequenced copolymer is between 50 and 99% by weight of the composition, the total rubber content, which include the rubbery dienic polymer and the dienic polymer present in the sequenced copolymer, is between 1 and 50% by weight of the composition, the amount of sequenced copolymer being such as to bring to the composition from 3 to 90% by weight of the total rubber in the composition.

4,145,377

COMPOSITION OF A POLYPHENYLENE ETHER, A STYRENE RESIN, A PRECOMPOUNDED POLYMER SYSTEM AND A BLOCK COPOLYMER OF A VINYL AROMATIC COMPOUND AND AN OLEFINIC ELASTOMER

Jan Bussink, Bergen op Zoom, and Johannes W. J. de Munck, Huybergen, both of Netherlands, assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 3, 1976, Ser. No. 747,327
Int. Cl.[2] C08L *53/02*
U.S. Cl. 260—876 B 21 Claims

1. A high impact strength thermoplastic composition comprising an intimate blend of:

(a) a polyphenylene ether resin, alone; or combined with

(b) a styrene resin;

(c) a precompounded composition comprising from 80 to 20 parts by weight of an olefinic resin comprising polyethylene or a poly-α-olefin resin, alone or in further combination with a minor, effective amount of a dispersing aid, and correspondingly from 20 to 80 parts by weight of a linear, sequential or radial teleblock copolymer of a vinyl aromatic compound $(A)_n$ and (A)1/n and an olefinic elastomer (B), of the A-B-A[1]; A-(B-A-B)$_n$-A; $A(BA)_nB$; $(A)_4B$; $B(A)_4$; or $B[(AB)_nB]_4$ type, wherein n is an integer of from 1 to 10 obtained by the hydrogenation of a conjugated diene polymer; and

(d) an elastomeric block copolymer of one of the types set forth in (c).

4,145,378

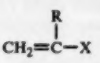
METHOD FOR THE PREPARATION OF NOVEL THERMOPLASTIC MATERIALS, AND PRODUCTS OBTAINED THEREBY

Sergio Arrighetti, Milan; Aldo Brancaccio, Cremona; Sebastiano Cesca, and Giampaolo Giuliani, both of San Donato Milanese (Milan), all of Italy, assignors to Anic S.p.A., Palermo, Italy

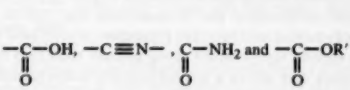
Filed Apr. 5, 1977, Ser. No. 784,786
Claims priority, application Italy, Apr. 22, 1976, 22543 A/76
Int. Cl.[2] C08F *255/00, 255/02, 255/04, 255/08*
U.S. Cl. 260—876 R 13 Claims

1. A thermoplastic material comprised of:

(a) a resinous phase obtained by polymerizing a member of the group consisting of alkeny aromatic monomers, acrylic monomers having the general formula:



wherein R is H or an alkyl group having from 1 to 5 carbon atoms and X is a member of the group consisting of

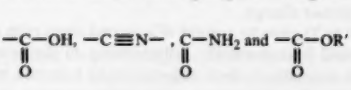


wherein R′ is an alkyl group having from 1 to 9 carbon atoms, vinyl monomers having the general formula $CH_2 = CH - X'$ wherein X′ is Cl or $-OCOCH_3$, maleic anhydride, imidic maleic anhydride, unsaturated monomers containing an epoxy group, and mixtures thereof; and

(b) a saturated elastomeric phase obtained by admixing at least two members of the group consisting of copolymers of ethylene with at least one linear or branched ethylene homolog and having grafted thereon at least one member of the resinous phase of group (a).

4. The method of preparing a thermoplastic material which comprises dissolving in a hydrocarbon solvent a saturated elastomeric phase obtained by admixing at least two members of the group consisting of copolymers of ethylene with at least one linear or branched ethylene homolog and a member of the group of monomers consisting of alkenyl aromatic monomers, acrylic monomers having the general formula:

wherein R is H or an alkyl group having from 1 to 5 carbon atoms and X is a member of the group consisting of



wherein R′ is an alkyl group having from 1 to 9 carbon atoms, vinyl monomers having the general formula $CH_2 = CH - X'$ wherein X′ is Cl or $-OCOCH_3$, maleic anhydride, imidic maleic anhydride, unsaturated monomers containing an epoxy group, and mixtures thereof, and polymerizing said monomers and grafting them onto said saturated elastomeric phase in the presence of a radical initiator.

4,145,379

SULFONATED POLYMER COMPOSITION

Robert D. Lundberg, Bridgewater; Henry S. Makowski, Scotch Plains, both of N.J., and Jan Bock, Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,729
Int. Cl.[2] C08L 9/00, 47/00
U.S. Cl. 260—879 34 Claims

1. An improved process for the preparation of a plasticized composition of a sulfonated polymer from a neutralized sulfonated polymer having about 0.1 to about 10.0 mole percent sulfonate groups, at least 90% of which being neutralized with a neutralizing agent selected from the group consisting of metallic derivatives of organic acids, metallic alkanoates, metallic hydroxides, and amine derivatives and mixtures thereof, wherein the improvement comprises:

(a) adding at ambient temperature about 1 to about 50 parts per hundred by weight of a reactive plasticizer to 100 parts of said neutralized sulfonated polymer to form a mixture of said sulfonated polymer and said reactive plasticizer, said plasticizer being an ester of an α β-unsaturated monocarboxylic acid:

(b) adding a free radical catalyst to said mixture at a concentration level of at least about 0.05 parts per hundred by weight of said reactive plasticizer;

(c) heating said mixture with said free radical catalyst to a first temperature for solvating said neutralized sulfonate groups with said reactive plasticizer; and

(d) further heating said mixture with said reactive plasticizer to a second temperature sufficient to permit processability of said composition and to cause said free radical catalyst to polymerize said reactive plasticizer within said mixture, said second temperature being greater than said first temperature and above a decomposition temperature of said free radical catalyst.

4,145,380

VINYL HALIDE POLYMER IMPACT MODIFIERS

Robert M. Myers, Philadelphia; David L. Dunkelberger, Levittown, both of Pa., and Daniel T. Carty, Willingboro, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 494,810, Aug. 5, 1974, Pat. No. 3,971,835, which is a continuation of Ser. No. 184,913, Sep. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 56,007, Jul. 17, 1970, abandoned. This application Jan. 19, 1976, Ser. No. 650,480
Int. Cl.[2] C08F 257/02, 265/06, 291/02, 291/06
U.S. Cl. 260—879 14 Claims

1. A composition comprising a three stage, sequentially produced graft polymer comprising

(A) 5 to 50 parts by weight of a first non-rubbery, hard polymer stage formed by polymerization of a monomer charge of 50 to 100 weight percent of a vinylaromatic compound and 0.1 to 10 weight percent of a polyfunctional crosslinking monomer based on the weight of the monomer charge;

(B) 20 to 75 parts by weight of a second stage rubb polymer formed by sequentially polymerizing in the presence of first non-rubbery hard polymer stage a second monomer charge of to 100 percent of butadiene, isoprene, or chloroprene, or mixtures thereof, or an alkyl acrylate wherein the alkyl acrylate has about 2 to 8 carbon atoms, and

(C) 15 to 40 parts by weight of a third stage polymer formed by sequentially polymerizing in the presence of the Stage (B) polymer product a monomer charge of 50 to 100 weight percent of an alkyl methacrylate wherein the alkyl group has about 1 to 4 carbon atoms.

4,145,381

THERMOPLASTIC GRAFT COPOLYMERS

Michael G. Roberts, Heath, and Charles E. Bolen, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 502,691, Sep. 3, 1974, Pat. No. 3,998,909. This application Sep. 29, 1976, Ser. No. 727,827
Int. Cl.[2] C08F 291/02, 257/02
U.S. Cl. 260—880 R 8 Claims

1. A thermoplastic composition comprising unsaturated graft copolymer produced by polymerization to less than 50 percent conversion of a reaction mixture containing:

(a) a monomer;

(b) up to about 5 percent by weight of said reaction mixture of an organic acid or anhydride which contains one reactive double bond per molecule thereof;

(c) about 0.1 to 7.5 percent by weight of said reaction mixture of a first unsaturated elastomeric polymer having weight average molecular weight from about 43,000 to 380,000, being soluble in said monomer and containing at least about 10 percent by weight thereof of a diene; and

(d) about 0.1 to 15 percent by weight of said reaction mixture of a second unsaturated elastomeric polymer having weight average molecular weight from about 500 to 40,000, being soluble in said monomer and containing at least about 10 percent by weight thereof of a diene.

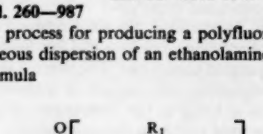
4,145,382

PROCESS FOR PRODUCING POLYFLUOROALKYL PHOSPHATES

Takao Hayashi, Zushi, and Shoichi Kawakami, Yokohama, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 30, 1977, Ser. No. 856,101
Claims priority, application Japan, Dec. 16, 1976, 51/150359
Int. Cl.[2] C07F 9/09
U.S. Cl. 260—987 15 Claims

1. A process for producing a polyfluoroalkyl phosphate as an aqueous dispersion of an ethanolamine salt thereof having the formula



wherein R_f represents a C_5–C_{14} perfluoroalkyl group; R_1 and R_2 each represent hydrogen or $—CH_2CH_2OH$; R represents a C_1–C_4 divalent alkylene group; and m represents a value within the range of 1 to 2.5, which comprises:

(a) reacting a polyfluoroalkanol having the formula R_fROH with a phosphorous oxyhalide in the presence of water in amounts consistent with the ratio of corresponding components in said salt above under reaction conditions which minimize the production of oligomer by-product, which maintain the viscosity of the reaction solution at desirable levels and which avoid foaming of the reaction solution;

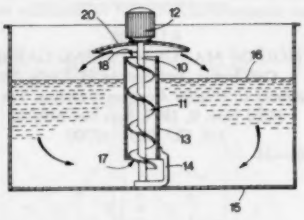
(b) hydrolyzing the partially hydrolyzed polyfluoroalkylphosphophalide obtained under conditions which effect the formation of the desired perfluoroalkylphosphate, said steps (a) and (b) being conducted under conditions which remove hydrogen halide eliminated in the reactions from the reaction solutions; and

(c) reacting the polyfluoroalkylphosphate product obtained with an ethanolamine in a quantity of water sufficient to maintain an acceptable viscosity of reaction solution to ensure a smooth and homogeneous reaction and sufficient to yield a product solution which when applied to a substrate exhibits the desired degree of water repellency.

4,145,383
SLURRY AERATION METHOD AND APPARATUS

Bryce E. Randall, Edmunds, England, assignor to Howard Machinery Limited, Edmunds, England

Continuation of Ser. No. 719,454, Sep. 1, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 861,440
Int. Cl.[2] C02C *1/18*
U.S. Cl. 261—29 12 Claims

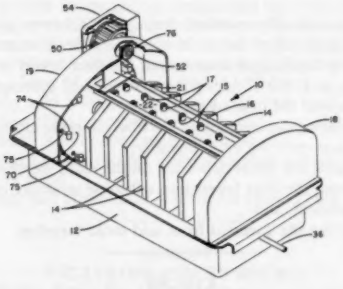


1. A method of aerating slurry comprising the steps of
providing aeration apparatus including a tubular casing and a screw conveyor in said tubular casing which has its periphery spaced inwardly from the casing, said casing having open upper inlet means and open lower outlet means;
immersing said aeration apparatus in a body of slurry so that the lower outlet means is below the surface level and the slurry fills the casing to said surface level and so that the inlet means is accessible to air above the surface level;
and thereafter rotating the screw conveyor in a direction to pump slurry in the casing down through the outlet means so that air enters the casing through the inlet means to extend down to the level of the outlet means and is discharged from the outlet means into the body of slurry, with slurry remaining in the casing to form a vortex against the inner wall of the casing.

4,145,384
HUMIDIFIER

Neil D. Wagaman, Liverpool, N.Y.; Hatcher R. Meeks, and Donald E. Alexander, both of Knoxville, Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,321
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—35 1 Claim

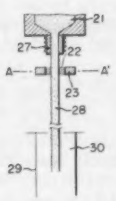


1. A humidifier for use with a water source and a flowing air stream including:
a water receptacle for containing water;
a water conduit to connect the water receptacle to the water source;
water control means to maintain the water in the water receptacle at a predetermined level;
at least one gas-liquid contact member wherein water is evaporated from the contact member into the air stream and excess water from the contact member flows into the water receptacle;
a water distribution system positioned above the contact member wherein water flows by gravity from the water distribution system over the contact member, for collecting water and regulating the flow of water over the contact member so that an amount of water sufficient to clean the contact member intermittently flows thereover;
a fan wheel positioned in the flowing air stream so that it is rotated thereby;
a fan wheel shroud covering the fan wheel for guiding air thereto;
at least one cup for carrying water from the water receptacle to the water distribution system;
a water wheel powered by rotation of the fan wheel for supporting the cup for movement between the water receptacle and the water distribution system wherein the cup is pivotally attached to the water wheel above the center of gravity of the cup when it is filled with water and when it is empty, whereby the cup tends to stay in an upright position, and wherein, as the water wheel rotates, the cup passes below the predetermined level of water in the water receptacle and fills with water, and passes above the water distribution system;
tipping means to pivot the cup about its pivot point as the cup passes above the water distribution system for spilling water from the cup into the water distribution system;
a drive system connecting the fan wheel and the water wheel so that rotation of the fan wheel moves the cup between the water receptacle and the water distribution system; and
a frame member for shielding the cup and the water wheel from the flowing air stream to prevent the air stream from causing the cup to lose water and to prevent the air stream from retarding movement of the cup and the water wheel.

4,145,385
PASTE EXTRUSION OF PTFE

Junichi Sako, Suita; Norimasa Honda, Settsu; Hideo Tokunaga, Osaka; Toshiro Hoshino, Seettsu, and Shin-ichiro Kai, Ibaraki, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 15, 1977, Ser. No. 860,889
Claims priority, application Japan, Dec. 25, 1976, 51-157260
Int. Cl.[2] B29F *3/03*
U.S. Cl. 264—22 5 Claims



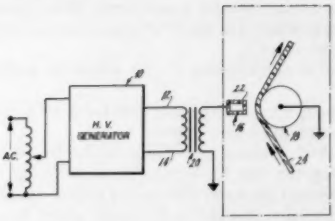
1. In a process for producing a molded article by extrusion of a paste of a powder of polytetrafluoroethylene admixed with a volatile extrusion lubricant, wherein the paste is extruded through a die to form a molding having a relatively dense suface layer and the molding is subsequently sintered by passing it through a heating zone for drying and sintering, the improvement comprising breaking said surface layer of the extruded molding prior to entry into the heating zone, thereby facilitating volatilization of the lubricant from the molding.

4,145,386

METHOD FOR THE SURFACE TREATMENT OF THERMOPLASTIC MATERIALS

Louis A. Rosenthal, Highland Park, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,309
Int. Cl.[2] B29D *3/00*; H05B *7/16*
U.S. Cl. 264—22 **3 Claims**



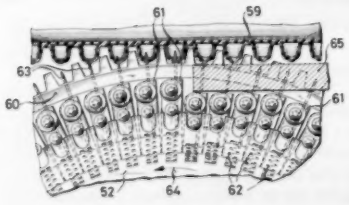
1. In a process for the corona discharge surface treatment of thermoplastic material, wherein a continuum of said material is passed through an air gap between stationary bar type and relatively large roller type electrodes across which high voltage is impressed, the improvement which comprises employing, as said stationary bar type electrode, a metallic substrate of high electrical conductivity having a continuous coating layer of porcelain enamel dielectric material; and an outer continuous shielding layer of material thereover consisting essentially of at least one member selected from the group consisting of refractory metal oxides, nitrides, carbides and borides having properties of high mechanical strength, chemical stability at elevated temperatures and high thermal conductivity.

4,145,387

METHOD OF MANUFACTURING DOUBLE-WALL PLASTIC TUBING IN WHICH THE OUTER WALL HAS TRANSVERSE CORRUGATIONS AND THE INNER WALL IS SMOOTH

Wilhelm Hegler, Goethe Str. 2, Bad Kissingen, Fed. Rep. of Germany (873), and Ralph-Peter Hegler, Bad Kissingen, Fed. Rep. of Germany, assignors to Wilhelm Hegler, Bad Kissingen, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,778
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637995
Int. Cl.[2] B29D *23/04, 23/18*; B29C *17/07*
U.S. Cl. 264—23 **7 Claims**



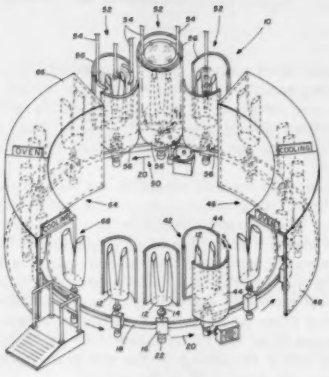
1. In a method for manufacturing double-wall plastic tubing wherein two tubes are extruded from two concentrically disposed annular dies, the outer tube being carried between two oppositely circulating sets of mold halves which join together along their path to define whole molds, the molds being provided with annular depressions and elevations and the outer plastic tube being made to conform to the molds by a pressure differential whereby it obtains annular transverse corrugations and an inner tube is extruded from the inner annular die to engage and fuse to the outer tube by a pressure medium, the improvement which comprises forming an opening in said outer tube or between said inner tube and said outer tube before said inner tube has hardened, said opening communicating with the region defined between the wall of said annular corrugation and said inner tube with the next adjacent region defined by the wall of a next adjacent corrugation and said inner tube or with the exterior beyond said outer tube and thereafter cooling the double-wall tube to harden said inner tube.

4,145,388

METHOD OF MANUFACTURING GARMENTS

Joseph W. A. Off, Irving, and Judson H. Early, Dallas, both of Tex., assignors to Haggar Company, Dallas, Tex.

Filed Nov. 9, 1977, Ser. No. 849,769
Int. Cl.[2] B29C *13/00*
U.S. Cl. 264—24 **12 Claims**



1. A method of fabricating a nonwoven garment, comprising:

a. providing a mold member in the shape of the desired garment and including means for selectively establishing at least one electrostatic field over said mold member;
b. establishing a predetermined electrostatic field about said mold member;
c. dispensing into said electrostatic field activatible fibers which are electrostatically deposited in a successive plurality of fiber layers over the mold member in a nonwoven mass;
d. electrostatically orienting during step (c) over predetermind portions of the mold member at least some of the fibers comprising at least one of the fiber layers in accordance with the elasticity requirements of corresponding portions of the desired garment;
e. terminating dispensation of the fibers into the electrostatic field and onto the mold member;
f. activating the fibers deposited on the mold member to set and bond the fiber layers into a flexible structure defining the garment; and
g. removing the garment from said mold member.

4,145,389

PROCESS FOR MAKING EXTRUDED PANEL PRODUCT

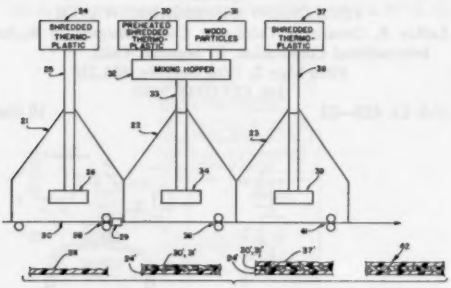
Teddy V. Smith, 13437 Kit La., Dallas, Tex. 75240

Filed Aug. 22, 1977, Ser. No. 826,943
Int. Cl.[2] B29C *15/00, 29/00*
U.S. Cl. 264—40.7 **7 Claims**

1. A process for producing a continuous running length of construction wall paneling from waste thermoplastic material including one or more or all of thermoplastic bottles, toys, tires, cartons, containers and the like and cellulose fiber mate-

rial such as shredded tree bark comprising the sequential repeated steps of:

(1) Simultaneously evenly distributing, from respective continuous flow sources, a substantially continuous bottom layer of shredded thermoplastic material on a first section of three cascaded contiguous sections of a planar surfaced movable conveyor in a thermal environment sufficient to fuse said thermoplastic material, an intermediate layer of shredded cellulose material mixed with shredded thermoplastic material on the second section in a thermal environment sufficient to fuse the thermoplastic material dis-



tributed in that section, and a further substantially continuous top layer of said shredded thermoplastic material on the third section in a thermal environment sufficient to fuse the thermal plastic material;

(2) advancing said conveyor forward by a predetermined distance while pressure rolling contiguous lengths of the material on said conveyor as it advances from the first to second section, the second section to the third, and from the end of said third section;

(3) stopping said conveyor after completing said predetermined advance distance.

4,145,390

PROCESS FOR MOUNTING COMPONENTS ON A BASE BY MEANS OF THIXOTROPIC MATERIAL

Gero Zschimmer, Adelmannstrasse 5, 8000 Munich 82, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,139

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2627178

Int. Cl.[2] B29C *27/00*

U.S. Cl. 264—69 **20 Claims**

1. A process for mounting components on a base utilizing a thixotropic material, the steps of said process including:

dipping said component into a stock of said thixotropic material such that at least one surface of said component has a layer of thixotropic material thereon;

pressing said component against said base such that said surface of said component having said layer of thixotropic material is in contact with said base; and

vibrating said thixotropic material during at least one of the above steps;

whereby said component is mounted on said base.

4,145,391

CELLULOSE FIBER PROCESS

Henry Rodier, Sainte-Foy-Les-Lyon, France, assignor to Rhone Poulenc Textile, Paris, France

Filed Nov. 23, 1977, Ser. No. 854,401

Claims priority, application France, Nov. 26, 1976, 76 35988

Int. Cl.[2] D01F *6/18*; C08L *1/24*

U.S. Cl. 264—83 **11 Claims**

1. In a process for producing shaped articles of cellulose by extruding a solution of cellulose in dimethylsulphoxide and formaldehyde, said solution containing at least 6% by weight/volume of cellulose in dimethylsulphoxide, said solution containing formaldehyde in a formaldehyde/cellulose weight ratio of between about 0.2 and 2, the improvement comprising extruding said solution into a gaseous atmosphere containing ammonia.

4,145,392

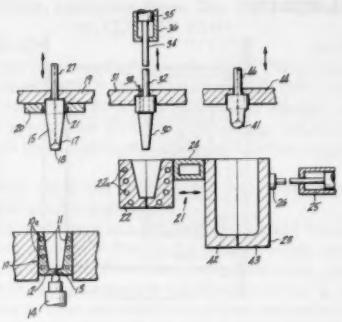
METHOD FOR THE PREPARATION OF HOLLOW PLASTIC ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., New York, N.Y. 10471

Continuation-in-part of Ser. No. 618,782, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 473,580, May 24, 1974, Pat. No. 3,966,378. This application Apr. 11, 1977, Ser. No. 786,461

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—513 **21 Claims**



1. In a method for the preparation of oriented hollow objects of organic plastic material by providing a parison on a core in a formable condition, locating said parison in a blow mold and expanding said parison within said blow mold to form a hollow object, the improvement which comprises: providing said parison on a first core in a formable condition; locating said first core bearing said parison in a first mold; retaining said parison in said first mold to adjust the temperature thereof for conditions suited for orientation and separating said first core from the parison; transferring said temperature adjusted parison to a second core from said first mold; locating said second core bearing said parison in a second mold; expanding said parison in said second mold into a finished article; retaining and cooling said finished article in said second mold and separating the second core therefrom, transferring said finished article to a third core from said second mold, locating said third core bearing said finished article laterally of said second mold; and ejecting said finished article from said third core, wherein said cores move only in a direction parallel to the parison axis and said molds move only in a lateral direction relative to the parison axis.

4,145,393

PROCESS FOR THE PROTECTION AGAINST CORROSION OF CAST IRON IN BOILING CONCENTRATED SULFURIC ACID

Helmold von Plessen, Kelkheim, and Edmund Bässler, Schwalkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 16, 1977, Ser. No. 807,319

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627536

Int. Cl.[2] C23F *11/04*

U.S. Cl. 422—7 **4 Claims**

1. A method for protecting gray cast iron from corrosion by boiling concentrated sulfuric acid, which comprises contacting the iron with the boiling concentrated sulfuric acid and an

amount of a precious metal selected from the group consisting of gold and metals of the platinum group or a compound thereof which is sufficient to effect an inhibition of the corrosion of the iron by the sulfuric acid.

4,145,394

CATALYST MONOLITH FOR EXHAUST GAS DECONTAMINATION, PREFERABLY IN MOTOR VEHICLES

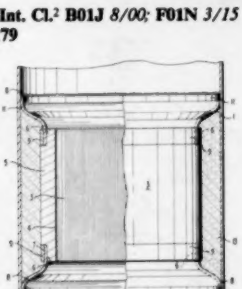
Jörg Abthoff, Pluderhausen, and Hans-Dieter Schuster, Grossheppach, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 15, 1974, Ser. No. 451,673

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1973, 2313166

Int. Cl.[2] B01J *8/00*; F01N *3/15*

U.S. Cl. 422—179 **13 Claims**



1. A catalytic converter for exhaust gas decomposition comprising

catalyst housing means including an inlet passage and an outlet passage,

a monolithic catalyst element in said catalyst housing means defining an inflow side, an outflow side and a plurality of passages extending between said inflow side and said outflow side, said monolithic catalyst element being positioned in said catalyst housing means so that exhaust gas passing therethrough passes through said monolithic catalyst element, said catalyst housing means being shaped in the form of a tube, said tube and said monolithic catalyst element having similar cross-sectional shapes, said monolithic catalyst element being smaller in cross section that said housing so that said monolithic catalyst element and said housing define an open space therebetween, and support means supporting said catalyst element in said catalyst housing means including at least one sleeve-shaped support member having axially spaced inlet and outlet rims of different diameters, the rim with the smaller diameter being bonded to said monolithic catalyst element, the rim with the larger diameter being secured to said catalyst housing means, said support means being bonded to said monolithic catalyst element by means of a layer of sintered metal.

4,145,395

DEACTIVATING PARTICULATE WASTE CONTAINING HYDROLYZABLE METAL CHLORIDES

Steven J. Fitch, Baltimore, and Philip R. Peeling, Finksburg, both of Md., assignors to SCM Corporation, New York, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,875

Int. Cl.[2] C01B *7/01*

U.S. Cl. 423—1 **4 Claims**

1. A process for dechlorinating a mass of particulate waste obtained from the chlorination of titaniferous materials in the presence of carbon, said waste containing elemental carbon and hydrolyzable metal chlorides including iron chloride, which comprises:

subjecting said waste to treatment with molecular oxygen at elevated temperature of about 325° to 650° C. in a treating zone until the resulting residue is substantially depleted of chlorine while retaining most of said carbon, said treatment conducted in the presence of water vapor for converting said chlorine into hydrogen chloride; and

withdrawing said residue from said zone.

4,145,396

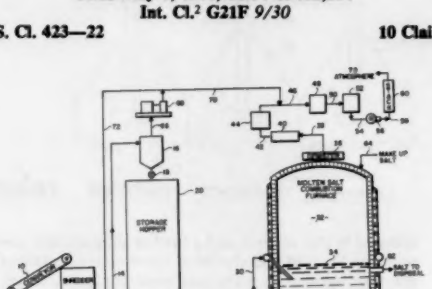
TREATMENT OF ORGANIC WASTE

LeRoy F. Grantham, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 3, 1976, Ser. No. 682,234

Int. Cl.[2] G21F *9/30*

U.S. Cl. 423—22 **10 Claims**



1. A method of treating an organic waste containing at least one volatile compound-forming element selected from the group consisting of strontium, cesium, iodine, and ruthenium comprising:

Introducing the organic waste and gaseous oxygen into a molten salt bath consisting essentially of an alkali metal carbonate or the mixture of an alkali metal carbonate and from 1 to 25 wt.% of alkali metal sulfate, said bath being maintained at an elevated temperature of from 400° to 1000° C. and under a pressure of from 0.5 to 10 atmospheres to at least partially oxidize and combust the organic waste, the selected element being retained in the molten salt bath.

4,145,397

PROCESS FOR RECOVERING MOLYBDENUM, VANADIUM, COBALT AND NICKEL FROM ROASTED PRODUCTS OF USED CATALYSTS FROM HYDROTREATMENT DESULFURIZATION OF PETROLEUM

Shigeo Toida, Tokyo; Akira Ohno, Ichikawa; Kozo Higuchi, deceased, late of Tokyo, Japan by Michiko Higuchi, heir at law and legal representative; by Makoto Higuchi, heir at law, and Yuko Higuchi, heir at law, both of Tokyo, Japan, assignors to Marubeni Corporation and Fuji Fine Chemical Co. Ltd., both of Tokyo, Japan

Filed Aug. 3, 1977, Ser. No. 821,523

Claims priority, application Japan, Aug. 6, 1976, 51/93242; Aug. 6, 1976, 51/93243; Aug. 6, 1976, 51/93244

Int. Cl.[2] C01G *31/00, 39/00, 51/12, 53/12*

U.S. Cl. 423—54 **41 Claims**

1. In a process for recovering molybdenum and vanadium from products obtained by oxidative roasting, at a temperature of from about 600° C. to about 950° C., of used catalysts from the hydrotreatment desulfurization of petroleum, the improvement which comprises:

(a) subjecting said roasted products to hot water alkaline leaching at a temperature of from about 50° C. to about

100° C. in the presence of a caustic alkali, the amount of the free caustic alkali in the leaching liquid being adjusted to a level of from about 10% to about 30% by weight based on the weight of said leaching liquid;

(b) separating the resulting aqueous leaching solution containing substantially all of the molybdenum and vanadium components from solids at a temperature of from about 50° C. to about 80° C. so as not to result in substantial deposition of the vanadium and molybdenum components;

(c) cooling the resulting aqueous leaching solution from step (b) to a temperature of from about 0° C. to about 40° C. to

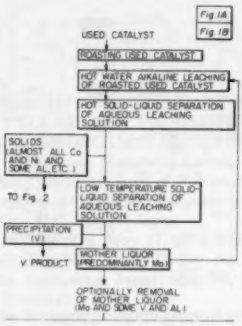


Fig 1A
Fig 1B
USED CATALYST
ROASTING USED CATALYST
HOT WATER ALKALINE LEACHING OF ROASTED USED CATALYST
HOT SOLID-LIQUID SEPARATION OF AQUEOUS LEACHING SOLUTION
SOLIDS (ALMOST ALL Co AND Ni AND SOME AL, ETC.)
TO Fig. 2
LOW TEMPERATURE SOLID-LIQUID SEPARATION OF AQUEOUS LEACHING SOLUTION
PRECIPITATION (V)
V PRODUCT
MOTHER LIQUOR (PREDOMINANTLY Mo)
OPTIONALLY REMOVAL OF MOTHER LIQUOR (Mo AND SOME V AND AL)

precipitate and separate the vanadium component therefrom;

(d) recycling the mother liquor resulting from said step (c) and containing mainly the molybdenum component to the hot water alkaline leaching in said step (a) to effect the hot water alkaline leaching of other roasted products while maintaining the alkali condition of said caustic alkali;

(e) repeating the recycled leaching and separation under the condition that the molybdenum content accumulated in the mother liquor by said repeated leaching does not exceed about 7% by weight based on said mother liquor.

5. The process according to claim 1, wherein in said step (e) mother liquor is removed.

4,145,398

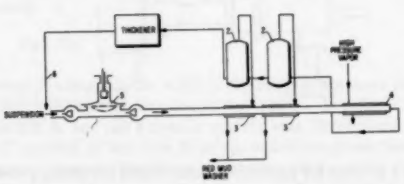
BAUXITE DIGESTION BY CAUSTIC ALKALI WITH IMPROVED HEAT TRANSFER IN TUBULAR REACTORS

Ludolf Plass, Kronberg, Taunus, Fed. Rep. of Germany, assignor to Vereinigte Aluminium-Werke A.G., Bonn, Fed. Rep. of Germany

Division of Ser. No. 443,870, Feb. 19, 1974, abandoned. This application Dec. 27, 1976, Ser. No. 754,749

Int. Cl.[2] C01F 7/06

U.S. Cl. 423—121 **4 Claims**



1. A process for the continuous extraction of bauxite with soda lye, comprising the steps of forming a suspension of particulate bauxite in soda lye wherein the concentration of bauxite is between substantially 1 and 6 volume %, said buaxite having an average particle size between substantially 10 and 150 microns; conveying said suspension along at least one conduit at a pressure between substantially 10 and 200 atmospheres, said suspension being coveyed at a flow rate between substantially 0.5 and 7 meters per second so as to establish and maintain turbulent flow with a corresponding Reynolds Number of the order of 10^5; and heating said suspension to temperatures between substantially 200° and 300° C. by conveying a heated medium in countercurrent flow to said suspension along another conduit substantially concentrically arranged with and in heat-exchange relationship with said one conduit.

4,145,399

PROCESS FOR THE REMOVAL OF NITROGEN OXIDE

Tokuzo Nagaoka; Takamoto Nishimura; Satoru Ono, all of Ube; Simaiti Nagata, Onoda; Naoki Yamashita, Ube; Yoshiyuki Tanaka, Ube, and Yoshihiko Hatabu, Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jan. 23, 1978, Ser. No. 871,432

Claims priority, application Japan, Jan. 31, 1977, 52-8820

Int. Cl.[2] C01R 21/00

U.S. Cl. 423—235 **16 Claims**

1. A process for removing nitrogen oxides (NO_x) including nitrogen monoxide (NO) and nitrogen dioxide (NO_2) from a waste gas containing 300–20,000 ppm of said nitrogen oxides and 1–2,000 ppm carbon dioxide by contacting said waste gas with an alkali metal hydroxide scrubbing solution comprising the steps of:

(a) adjusting the molar ratio of NO/NO_2 present in said waste gas to approximately 1;

(b) causing said waste gas and said alkali metal hydroxide scrubbing solution to flow in the same direction and contacting, in a parallel flow relationship, said waste gas with said alkali metal hydroxide scrubbing solution in a first scrubbing column provided with at least one packed layer having a height of 10–100 cm and packed with a packing having a specific surface area of not less than 800 m^2/m^3, whereby the nitrogen oxides present in said waste gas are removed;

(c) removing the scrubbing solution from said first scrubbing column before said alkali metal hydroxide is completely consumed, and;

(d) contacting a gas containing a relatively high concentration of nitrogen oxides adjusted to a molar ratio of NO/NO_2 of approximately 1 and having a (NO_x) content of 1.0–60.0% by volume with said removed scrubbing solution in a second scrubbing column, whereby the nitrogen oxides present in said gas are removed and alkaline compounds in the scrubbing solution are neutralized to alkali metal nitrites and nitrates.

4,145,400

PROCESS FOR THE PREPARATION OF PLURAL METAL CRYSTALLINE COMPOUNDS

John R. Adsetts, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 12, 1977, Ser. No. 787,277

Claims priority, application United Kingdom, Apr. 30, 1976, 17702/76

Int. Cl.[2] C01F 7/00; C01G 51/06, 53/06

U.S. Cl. 423—419 P **4 Claims**

1. A method of making a crystalline compound having a composition expressed by the general formula:

$$M_x^{2+}\ Al_2\ (OH)_{16}CO_3\ 4H_2O$$

where

M^{2+} is selected from the group consisting of nickel, cobalt, and mixtures thereof; and

$x = 6$

which comprises co-precipitating salts of the metal M^{2+} and aluminum in aqueous solution with sodium carbonate, adding to the resulting precipitate an alkali metal hydroxide in a quantity of 0.1 to 2.0 g calculated as equivalent sodium hydroxide per gram of metal M^{2+} in the precipitate, and ageing the precipitate by heating for a period to obtain a degree of crystal-

linity which is substantially increased when compared with the crystallinity of a precipitate aged for a similar period without the addition of alkali metal hydroxide.

4,145,401
HIGH EFFICIENCY CHLORINE DIOXIDE PRODUCTION AT LOW ACIDITY WITH METHANOL ADDITION

Richard Swindells, Caledon, and Maurice C. J. Fredette, Mississauga, both of Canada, assignors to ERCO Industries Limited, Islington, Canada

Filed Feb. 22, 1977, Ser. No. 770,362

Claims priority, application United Kingdom, Mar. 19, 1976, 11123/76; Mar. 8, 1977, 18783/77

Int. Cl.[2] C01B *11/02*

U.S. Cl. 423—478 **5 Claims**

1. In a process for the production of chloride dioxide which comprises continuously reducing chlorate ions with chloride ions in an acid aqueous medium containing sulphuric acid and having a total acid normality of about 2 to about 4.8 normal by

maintaining a reaction vessel containing said aqueous reaction medium under a subatmospheric pressure,

maintaining said reaction medium at its boiling point at a temperature below that above which substantial decomposition of chlorine dioxide occurs to evaporate water from the reaction medium and provide a gaseous mixture containing steam, chlorine dioxide and chlorine,

removing said gaseous mixture from said reaction vessel, recovering an aqueous solution of chlorine dioxide from said removed mixture,

maintaining substantially steady state conditions in said reaction medium by continuously feeding sodium chlorate, said chloride, and sulphuric acid into said reaction medium to make up chemicals consumed in said reducing step and to maintain said total acid normality in said reaction medium in the range of about 2 to about 4.8 normal,

maintaining the liquid level in said reaction vessel substantially constant by balancing water fed to the reaction vessel with water removed therefrom,

continuously depositing a salt comprising anhydrous neutral sodium sulphate from said reaction medium after the reaction medium becomes saturated thereby after the initial start-up of the process, and

removing said deposited salt from said reaction vessel,

the improvement which comprises carrying out said process in the presence of methanol in quantities sufficient to improve the efficiency of conversion of chlorate ions to chlorine dioxide by said process.

4,145,402
PROCESS FOR THE PRODUCTION OF HYDROGEN AND OXYGEN FROM WATER

Karl F. Knoche; Helmut Cremer, both of Aachen, and Gerhard Steinborn, Wuerselen, all of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 685,398, May 11, 1976, abandoned. This application Oct. 13, 1977, Ser. No. 841,834

Claims priority, application Fed. Rep. of Germany, May 16, 1975, 2521839

Int. Cl.[2] C01B *1/05, 13/02*

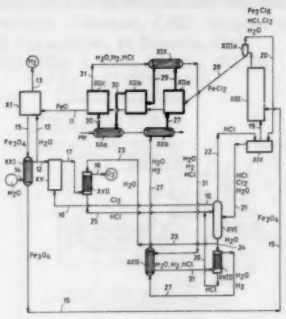
U.S. Cl. 423—579 **3 Claims**

1. In a thermochemical process for production of hydrogen and oxygen from water with the steps of

(a) reacting water vapor with iron(II)-oxide at a temperature of between about 600 to 1300 K to form iron(II, III)-oxide and hydrogen;

(b) reacting chlorine with (1) water vapor or (2) a member selected from the group consisting of iron (II, III)-oxide, iron(II)-oxide or mixtures thereof at a temperature of between about 550 to 1300 K to form respectively (1) oxygen and hydrogen chloride or (2) oxygen and iron(II)-chloride by cleaving the iron(III)-chloride obtained as an intermediate product to iron(II)-chloride and chlorine while recovering the hydrogen chloride from (1) or chlorine from (2) for recycle;

(c) reacting iron(II, III)-oxide obtained in step (a) with hydrogen chloride or a mixture of hydrogen chloride and chlorine at a temperature of between about 500 to 1300 K to form iron(II)-chloride whereby any iron(III)-chloride obtained as an intermediate product is cleaved to iron (II)-chloride and chlorine while recovering the chlorine for recycle;



(d) hydrolyzing iron(II)-chloride obtained with water vapor at a temperature of between about 700 to 1200 K; and

(e) recovering hydrogen and oxygen produced,

the improvement which comprises hydrolyzing the iron(II)-chloride with water vapor in the presence of hydrogen at a temperature of between about 700 to 1200 K in at least two series-connected reaction chambers which are maintained at sequentially higher temperature levels at a given time with the ratio of water vapor to hydrogen between about 1:3 to 2:1 to produce an iron product consisting of iron(II)-oxide.

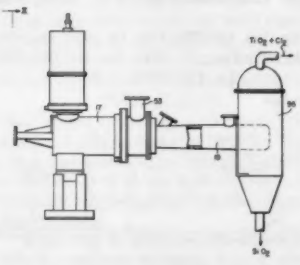
4,145,403
ARC HEATER METHOD FOR PRODUCING METAL OXIDES

Maurice G. Fey, Plum Boro, and Charles B. Wolf, Irwin, both of Pa.

Filed Sep. 29, 1977, Ser. No. 837,655

Int. Cl.[2] C01G *23/04*; C01F *7/02*; C01G *27/02, 25/02*

U.S. Cl. 423—613 **3 Claims**



1. In a process for producing metal oxides involving providing a polyphase arc heater system characterized by a plurality of arc heaters having arc chambers communicating with an elongated central mixing compartment; striking an electric arc in an axial gap between generally hollow, cylindrical electrodes spaced along a common axis that form the arc chamber in each of the intercommunicating arc heater chambers; causing an arc to rotate within the electrodes; directing oxygen through the gap into the arc chamber to thereby form an elongated arc and heated oxygen stream at a temperature of

from about 1600° to about 2300° C.; projecting the turbulent arc-heated oxygen stream generally radially into the central mixing compartment; the improvement comprising the steps of flowing the turbulent arc-heated oxygen stream through longitudinal channel means in the central mixing compartment to straighten the flow direction of the stream; introducing into the arc-heated oxygen stream a halide of a metal selected from the group consisting of Ti, Zr, Hf, Mg, and Al to form reaction products including an oxide of the metal and a halogen gas; and separating the reaction products.

4,145,404

MAGNESIUM HYDROXIDES HAVING NOVEL STRUCTURE, PROCESS FOR PRODUCTION THEREOF, AND RESIN COMPOSITIONS CONTAINING THEM

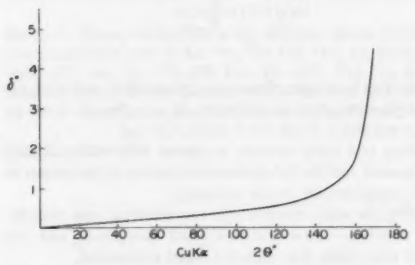
Shigeo Miyata, Takamatsu; Masataka Kuroda, Kagawa; Akira Okada; Toshumi Okazaki, both of Takamatsu, and Mitsuo Takasu, Marugame, all of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 690,778, May 27, 1976, Pat. No. 4,098,762. This application Nov. 10, 1977, Ser. No. 850,380

Claims priority, application Japan, May 30, 1975, 50/65049; Mar. 25, 1976, 51/31919

Int. Cl.² C01F *5/14*

U.S. Cl. 423—635 **4 Claims**



1. A magnesium hydroxide of the following formula

$$Mg(OH)_2$$

which has (i) a strain in the <101> direction of not more than 3.0×10^{-3}, (ii) a crystallite size in the <101> direction of more than 800 A, and (iii) a specific surface area, determined by the BET method, of less than 20 m^2/g.

2. A process for preparing a magnesium hydroxide of the formula

$$Mg(OH)_2$$

having (i) a strain in the <101> direction of not more than 3.0×10^{-3}, (ii) a crystallite size in the <101> direction of more than 800 A, and (iii) a specific surface area, determined by the BET method, of less than 20 m^2/g, which comprises heating a basic magnesium chloride or magnesium nitrate of the formula

$$Mg(OH)_{2-x}A_x.mH_2O$$

wherein A represents Cl or NO_3, x is a number of more than 0 but less than 0.2, and m is a number of 0 to 6, in an aqueous medium at an elevated pressure and temperature sufficient to convert said basic magnesium chloride or magnesium nitrate to said magnesium hydroxide.

4,145,405

PRODUCTION OF A HYDROGEN-RICH GAS FROM A CO-CONTAINING FUEL GAS

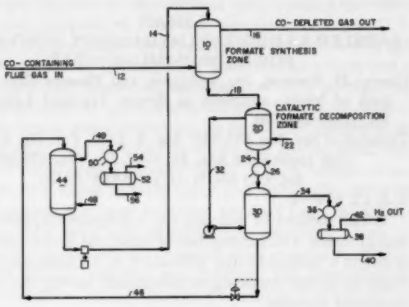
Everett Gorin, Pittsburgh, Pa., assignor to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 665,596, Mar. 10, 1976, Pat. No. 4,067,958. This application Aug. 22, 1977, Ser. No. 826,803

The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.

Int. Cl.² C01B *1/02, 1/13*

U.S. Cl. 423—657 **6 Claims**



1. In a process for the production of a hydrogen-rich gas from a fuel gas containing carbon monoxide and nitrogen or methane or both, the process consisting essentially of;

(a) contacting said fuel gas with an aqueous absorbing solution which contains sodium or potassium bicarbonate and carbonate under formate synthesis conditions of a temperature in the range of 400°–600° F. and a pressure in the range of 20 to 150 atm., whereby an aqueous solution which contains principally formate is produced; and thereafter

(b) heating the aqueous formate-containing solution produced in step (a) to decompose the formate to produce a hydrogen-rich gas and regenerate said aqueous absorbing solution,

the improvement comprising;

heating said aqueous formate-containing solution in contact with a catalyst, said catalyst consisting essentially of at least one member selected from the group consisting of molybdenum and tungsten metals and their oxides and sulfides supported on an alkali resistant base.

4,145,406

SPECIFIC BINDING - ADSORBENT ASSAY METHOD AND TEST MEANS

Lloyd A. Schick, and Stephen K. Carpenter, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 11, 1977, Ser. No. 786,207

Int. Cl.² G01N *33/16*

U.S. Cl. 424—1 **61 Claims**

1. A method for determining a specific binding substance in a liquid sample, comprising the steps of:

(a) contacting said sample with (1) a specific binding partner of the substance to to determined, which binding partner is incorporated with a label and which labeled binding partner has a pI value different from that of said substance to be determined, and (2) a solid ion exchange adsorbent (i) of an anionic type when the pI value of said substance to be determined is less than that of said binding partner, or (ii) of a cationic type when the pI value of said substance to be determined is greater than that of said labeled binding partner; and

(b) determining the amount of the label which either (i) becomes associated with the adsorbent by binding of the

labeled binding partner with adsorbed substance to be determined or (ii) remains unassociated therefrom,

wherein step (a) is performed under conditions of pH between the pI value of the substance to be determined and that of said labeled binding partner.

4,145,407

LABELED 5,5-DIPHENYLHYDANTOIN DERIVATIVES FOR RADIOIMMUNOASSAY

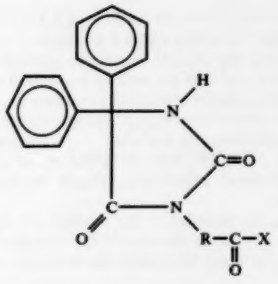
George H. Parsons, Jr., Arlington, and Thomas Eller, Boston, both of Mass., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 673,853, Apr. 5, 1976, Pat. No. 4,092,479. This application Sep. 22, 1977, Ser. No. 835,481

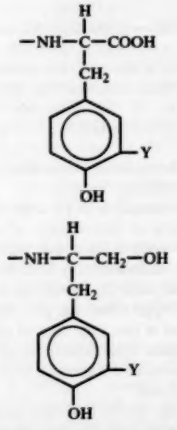
Int. Cl.[2] G01N *33/16*; A61K *43/00*

U.S. Cl. 424—1 **2 Claims**

1. The method of assaying the 5,5-diphenylhydantoin content of serum which comprises bringing the serum into contact with (1) a radioiodinated derivative of a compound selected from the group consisting of compounds having the following structural formula:



wherein R is selected from the group consisting of straight and branched aliphatic acyl groups in which R contains from 1 to 7 carbon atoms and in which R may contain, in addition to carbon and hydrogen, up to two hydroxyl and amino groups, and wherein X is selected from the group consisting of the following ring-containing amino radicals:



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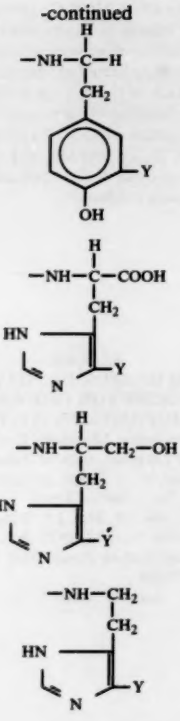


wherein Y is hydrogen, fluoro, or lower alkyl, and with (2) 5,5-diphenylhydantoin antibody in a buffer to form an assay mixture,

incubating said assay mixture to permit said radioiodinated compound and the 5,5-diphenylhydantoin in the serum to bind competitively to the antibody,

separating the assay mixture into two portions, one containing antibody-bound radioiodinated compound and the other containing free radioiodinated compound,

and measuring the radioactivity of one of said portions.

4,145,408

CONTROLLED RELEASE ARTICLE

Robert G. Laughlin, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 714,540, Aug. 16, 1976, Pat. No. 4,067,961, which is a continuation of Ser. No. 560,020, Mar. 19, 1975, abandoned. This application Oct. 31, 1977, Ser. No. 847,183

Int. Cl.[2] A61K *9/24, 9/48*

U.S. Cl. 424—16 **7 Claims**

1. A controlled release article especially adapted to maintaining a useful concentration of a spermicidal surfactant compound in the vagina, comprising:

(a) a solution consisting essentially of:

(i) a micelle-forming nonionic spermicidal surfactant compound, and

(ii) water, said solution having a concentration above the critical micelle concentration of the spermicidal surfactant compound, said solution being releasably enclosed in;

(b) a stable, insoluble container, at least part of the wall of said container comprising a microporous non-cellulose membrane.

4,145,409

ACARICIDAL RESIN COMPOSITION CONTAINING SPIRO[CYCLOPROPANE-1,-1'-INDENE]-2-CARBOXYLIC ACID, 3,3-DIMETHYL-, α-CYANO-M-PHENOXYBENZYL ESTER

Nunzio R. Pasarela, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 750,041, Dec. 13, 1976, abandoned. This application Jun. 22, 1978, Ser. No. 918,173

Int. Cl.[2] A01K *27/00, 29/00;* A01M *1/20*

U.S. Cl. 424—16 8 Claims

1. A flexible collar for controlling acarina on companion animals comprising: a flexible strip of an acaricidally dry blended polyvinyl chloride resin composition containing from 48% to 66% of a polyvinyl chloride resin having an approximate average molecular weight of 120,000 and an inherent viscosity of about 0.80, from 18% to 35% of spiro[cyclopropane-1,1'-indene]-2-carboxylic acid, 3,3-dimethyl-,α-cyano-m-phenoxybenzyl ester, from 15% to 25% of a plasticizer selected from the class consisting of dioctyl phthalate and octyl epoxytallate, from 0.1% to 0.5% of stearic acid lubricant, and from 0.5% to 1.5% of di-n-octyltin maleate polymer stabilizing agent, said percentages being by weight based on the overall said composition.

4,145,410

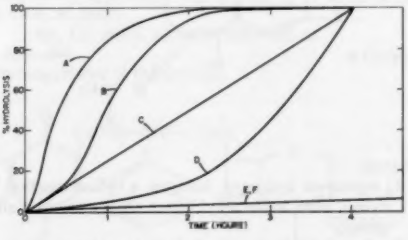
METHOD OF PREPARING A CONTROLLED-RELEASE PHARMACEUTICAL PREPARATION, AND RESULTING COMPOSITION

Barry D. Sears, 43 Bay State Rd., Boston, Mass. 02215

Continuation-in-part of Ser. No. 731,132, Oct. 12, 1976, Pat. No. 4,086,257, Ser. No. 770,290, Feb. 22, 1977, Pat. No. 4,097,503, and Ser. No. 770,407, Feb. 22, 1977, Pat. No. 4,097,502. This application Jun. 17, 1977, Ser. No. 807,373

Int. Cl.[2] A61K *9/52;* B01J *13/02*

U.S. Cl. 424—19 10 Claims



1. In a method for preparing a controlled-release pharmaceutical composition for oral administration, the method which comprises: forming an aqueous emulsion of phospholipid encapsulating agent with the pharmaceutical compound whose release is to be controlled; coagulating the emulsion to entrap the pharmaceutical compound within the phospholipid agent; and recovering the pharmaceutical composition as prepared, the improvement which comprises:

employing as the phospholipid encapsulating agent a synthetic fatty-acid phosphatidyl C_1–C_{10} alkyl-N-C_1-C_4 trialkyl quaternary-ammonium hydroxide compound, with the proviso that the alkyl of the alkyl-N group is not an ethyl group when the alkyl groups of the N-trialkyl radicals are methyl groups, and which phosphatidyl quaternary-ammonium compound is resistant to enzymatic hydrolysis of phospholipase C.

9. The controlled-release pharmaceutical composition prepared by the method of claim 1.

4,145,411

PRESSURIZED FOAMING SHAVING COMPOSITION

William C. Mende, Neshanic, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 503,237, Sep. 5, 1974, abandoned, which is a continuation of Ser. No. 305,865, Nov. 13, 1972, abandoned. This application Feb. 23, 1976, Ser. No. 660,295

Int. Cl.[2] A61K *7/15;* A61L *9/04*

U.S. Cl. 424—45 1 Claim

1. In a pressurized foaming shaving composition in a valved container which is adapted to maintain the composition under pressure and dispense it when desired upon opening the valve thereof, said composition consisting essentially of 1% to 10% by weight of a propellant to pressurize the composition in the container and aid in discharging it therefrom as a foam and a shave cream base consisting essentially of 70% to 90% by weight of an aqueous medium selected from the group consisting of water and water containing up to 20% by weight of an alcohol containing 2 to 3 carbon atoms and having dissolved, emulsified or dispersed therein 5% to 15% by weight of an anionic surface active foaming agent and, optionally, 0.5% to 3% by weight of a foam stabilizer selected from the group consisting of a fatty acid alkanolamide containing 12 to 18 carbon atoms in the fatty acid, organic gum, an organic colloid, propylene glycol, glycerol and sorbitol, the improvement wherein said shave cream base contains a mixture of about 0.25 to 1% mineral oil, about 0.005 to 0.025% of lanolin and about 0.001 to 0.006% of urea to thicken the foam of the composition dispensed from the container, the proportions of said mixture being based upon the shave cream base.

4,145,412

COMPOSITION FOR APPLICATION TO ORAL CAVITY AND METHOD FOR PREPARATION THEREOF

Peter A. Ladanyi, Fort Collins, Colo., assignor to Vipont Chemical Company, Fort Collins, Colo.

Filed Feb. 14, 1977, Ser. No. 768,278

Int. Cl.[2] A61K *7/26*

U.S. Cl. 424—58 5 Claims

1. Composition for application to oral cavities consisting of:

(a) an extract of Sanguinaria canadensis, produced by treating cut or ground bloodroot with methanol by maintaining the solids with the solvent for about 24 hours at about 60° C., filtering the resultant solvent and evaporating it to dryness and the resultant residue is dissolved in chloroform and adjusted to an acid pH with HCl and dried, and the resultant residue dissolved in glycerine, in an amount of from 0.1 weight percent to 40.0 weight percent, and from 0.1–30 weight percent of zinc chloride, and

(b) an innocuous carrier arranged for application to an oral cavity.

4,145,413

ARTIFICIAL SKIN DARKENING COMPOSITION AND METHOD OF USING THE SAME

Vera R. Usdin, Arlington, Va., and Edwin Kaszynski, Wheaton, Md., assignors to The Gillette Company, Boston, Mass.

Filed Aug. 15, 1977, Ser. No. 824,792

Int. Cl.[2] A61K *7/021, 7/42*

U.S. Cl. 424—63 6 Claims

1. A skin coloring composition comprising an aqueous dermatologic base containing cuprous chloride and a member of the group consisting of benzyl alcohol and 2,3-dihydroxybenzoic acid, the concentration of said member in water being from 2 percent to 4 percent by volume and of said cuprous chloride in water being from 0.045 percent to 0.09 percent by weight.

4,145,414
ORGANIC COMPOUNDS AND COMPOSITIONS OF ARA-CYTIDINE

Robert C. Kelly, Kalamazoo, Mich., and William J. Wechter, Marblehead, Mass., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 593,890, Jul. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 427,183, Dec. 21, 1973, abandoned, which is a continuation of Ser. No. 11,826, Feb. 16, 1970, Pat. No. 3,847,898, which is a continuation-in-part of Ser. No. 828,380, May 27, 1969, abandoned. This application Sep. 13, 1977, Ser. No. 832,965

Int. Cl.[2] C07H *17/00;* A61K *31/70*

U.S. Cl. 424—180 26 Claims

1. A compound selected from the group consisting of 5'-O-benzoyl ara-cytidine, 5'-O-lauroyl ara-cytidine, 5'-O-stearyl ara-cytidine, 5'-O-palmityl ara-cytidine, or 5'-O-(p-anisoyl) ara-cytidine, and the pharmaceutically acceptable acid addition salts thereof.

14. A pharmaceutical composition comprising, in unit dosage form, from about 3 to about 1000 milligrams of a compound selected from the group consisting of 5'-O-benzoyl ara-cytidine, 5'-O-palmityl ara-cytidine, 5'-O-lauroyl ara-cytidine, or 5'-O-(p-anisoyl) ara-cytidine, or a pharmaceutically acceptable acid addition salt thereof, in association with a pharmaceutical carrier.

4,145,415
PHYSIOLOGICALLY ACTIVE SUBSTANCES AND THE ISOLATION THEREOF

Akihiko Sato, 11-18, Minoh 8-chome, Minoh, Japan

Filed Oct. 25, 1977, Ser. No. 845,426

Claims priority, application Japan, Oct. 30, 1976, 51-130741

Int. Cl.[2] A61K *35/78, 31/715*

U.S. Cl. 424—195 10 Claims

1. A physiologically active substance "B" derived from *Ganoderma lucidum* (Fr.) Karst which is a powder having the following characteristics:

(i) it possesses antitumor activity when orally administered,

(ii) when present in KBr disc, it has a characteristic infra-red spectrum which has absorption maxima at inter alia about 3350, 1620, 1380 and 1080 cm^{-1},

(iii) in aqueous solution, it has a characteristic ultra-violet spectrum with absorption maxima one of which is at about 257 nm,

(iv) it is negative in a steroid coloring reaction using a 1:1 reagent of concentrated sulfuric acid and acetic acid,

(v) it is positive in an aldehyde coloring reaction using an anisaldehyde-sulfuric acid reagent,

(vi) it is positive in an amino acid coloring reaction using a ninhydrin reagent,

(vii) it is soluble in aqueous ethanol, sparingly soluble in ethanol and insoluble in chloroform, ethyl ether and acetone.

2. A process for the isolation of a physiologically active substance which comprises extracting *Ganoderma lucidum* (Fr.) Karst with water under boiling, concentrating the resulting water extract under reduced pressure, extracting the condensate with an organic solvent and treating the remaining insoluble portion with an aqueous organic solvent to separate said substance "B" as defined in claim 1.

4,145,416
NOVEL AGENTS AND NOVEL METHODS FOR TREATMENT OF CLIMACTERIC DISTURBANCES

Ursula Lachnit-Fixson, and Friedmund Neumann, both of Berlin, Fed. Rep. of Germany, assignors to Schering, A.G., Berlin and Bergkamen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 699,192, Jun. 23, 1976, Pat. No. 4,076,811. This application Sep. 27, 1977, Ser. No. 837,323

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2645307

Int. Cl.[2] A61K *31/56;* C07J *9/00*

U.S. Cl. 424—238 23 Claims

1. A pharmaceutical composition for the treatment of climacteric disturbances, to be administered in three phases, which comprises:

for the first phase, 10–12 dosage units of a combination of an estradiol estrogen and an estriol estrogen, approximately in a weight ratio of from 2:1 to 1:8,

for the second phase, 9–11 dosage units of a combination of an estradiol estrogen and an estriol estrogen, approximately in a weight ratio of from 2:1 to 1:8 and a progestational agent; and

for the third phase, 6–8 dosage units of an estriol estrogen or a placebo.

4,145,417
BENZODIAZEPINES

Umakant D. Shenoy, London, England, assignor to DDSA Pharmaceuticlas Ltd., London, England

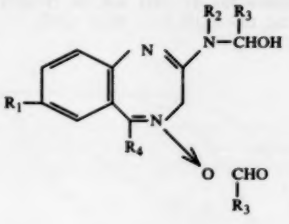
Division of Ser. No. 576,921, May 12, 1975, Pat. No. 4,061,745. This application Mar. 12, 1976, Ser. No. 666,383

Claims priority, application United Kingdom, May 14, 1974, 21195/74

Int. Cl.[2] A61K *31/55;* C07D *243/20, 401/04*

U.S. Cl. 424—244 13 Claims

1. A compound of the formula



I

wherein

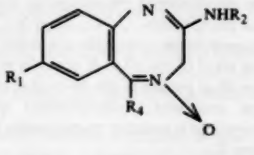
R_1 represents hydrogen, halogen, a trifluoromethyl group, cyano, nitro, lower alkyl, lower alkoxy or lower alkylthio group;

R_2 represents lower alkyl, hydroxy-(lower alkyl), lower alkenyl or a benzyl group;

R_3 represents a lower alkyl group; and

R_4 represents phenyl, (lower alkyl)-phenyl, nitrophenyl, halophenyl or a pyridyl group.

7. Process for the preparation of a compound according to claim 1 which comprises reacting an aqueous solution of a 1,4-benzodiazepine-4-oxide of the formula



IV

wherein

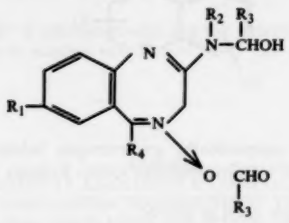
R_1 represents hydrogen, haloen, a trifluoromethyl group,

cyano, nitro, lower alkyl, lower alkoxy or lower alkylthio group;

R_2 represents a lower alkyl radical; and

R_4 represents a phenyl, (lower alkyl)-phenyl, nitrophenyl, halophenyl or pyridyl group with an aldehyde having the general formula R_3CHO in which R_3 represents a lower alkyl group, the mol ratio of said aldehyde to said 1,4-benzodiazepine-4-oxide being at least 3:1.

13. A therapeutic composition comprising a tranquilizing, sedating or hypnotizing amount of a compound of the formula



I

wherein

R_1 represents hydrogen, halogen, a trifluoromethyl group, cyano, nitro, lower alkyl, lower alkoxy or lower alkyl thio group;

R_2 represents lower alkyl, hydroxy-(lower alkyl), lower alkenyl or a benzyl group;

R_3 represents a lower alkyl group; and

R_4 represents phenyl, (lower alkyl)-phenyl, nitrophenyl, halophenyl, a pyridyl group, or an acid addition salt thereof in admixture with a pharmacologically acceptable diluent or carrier.

4,145,418

THIENOPYRIDINE SUBSTITUTED CEPHALOSPORINS

Yutaka Kuwada, Ashiya, and Kanji Meguro, Takarazuka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

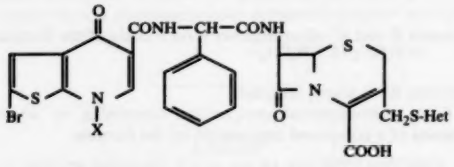
Filed Dec. 29, 1976, Ser. No. 755,428

Claims priority, application Japan, Jan. 6, 1976, 51-1315; Mar. 29, 1976, 51-34971

Int. Cl.[2] A61K *31/545;* **C07D** *501/36*

U.S. Cl. 424—246 **6 Claims**

1. A thienopyridine of the formula:



wherein X is methyl or ethyl and Het is an unsubstituted or substituted nitrogen-containing heterocyclic group; the nitrogen-containing heterocyclic group being selected from the group consisting of pyridyl, N-oxide-pyridyl, pyrimidyl, pyridazinyl, N-oxide-pyridazinyl, pyrazolyl, imidazolyl, thiazolyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,5-thiadiazolyl, 1,2,3-oxadiazolyl, 1,2,4-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,2,3-triazolyl, 1,2,4-thiazolyl, 1H-tetrazolyl and 2H-tetrazolyl, the substituent on the substituted nitrogen-containing heterocyclic group being selected from the group consisting of alkyl group having from 1 to 3 carbon atoms, alkoxy group having 1 to 3 carbon atoms, halogen, a halogenalkyl group having from 1 to 3 carbon atoms, hydroxyl, mercapto, amino, carboxyl, carbamoyl, morpholino, sulfo, alkoxycarbonyl having from 1 to 4 carbon atoms, mono-, di- or tri-C_{1-3} alkyl amino C_{1-3} alkyl, mono-, and di-C_{1-3} alkylcarbonyl C_{1-3} alkyl, alkylthioalkyl group having 1 to 3 carbon atoms in the alkyl groups, C_{1-3} alkylthio, and C_{1-3} alkylamino group, or a pharmaceutically acceptable salt thereof.

6. An anti-bacterially effective pharmaceutical composition comprising a thienopyridine according to claim **1**, together with pharmaceutically acceptable carrier or diluent therefor.

4,145,419

NOVEL IMIDAZOBENZOXAZINES

David A. Rowlands, Cirencester, and John B. Taylor, Ampney, Crucis, Near Cirencester, both of England, assignors to Roussel Uclaf, Paris, France

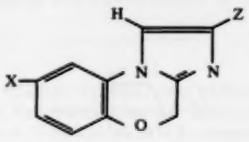
Continuation-in-part of Ser. No. 799,580, May 23, 1977, abandoned. This application Aug. 1, 1977, Ser. No. 820,836

Claims priority, application United Kingdom, May 21, 1976, 21111/76

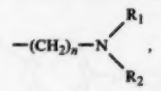
Int. Cl.[2] A61K *31/535;* **C07D** *498/02*

U.S. Cl. 424—248.4 **16 Claims**

1. A compound selected from the group consisting of imidazobenzoxazines of the formula



wherein X is selected from the group consisting of hydrogen, nitro, NH_2 and a protected amino, Z is —COOR R is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms,



alkali metal, alkaline earth metal, magnesium, aluminum and nitrogen bases, n is 1,2 or 3, R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms and taken together with the nitrogen atom to which they are attached form a member of the group consisting of pyrrolidino, piperidino, morpholino, piperazino and 4-methyl-piperazino and their non-toxic, pharmaceutically acceptable acid addition salts.

9. An antiallergic and bronchodilatory composition comprising an effective amount of at least one compound of claim **1** and an inert pharmaceutical carrier.

13. A method of relieving allergic asthma in warm-blooded animals comprising administering to warm-blooded animals an antiallergically effective amount of at least one compound of claim **1**.

4,145,420

PYRAZOLO(1,5-C)QUINAZOLINE DERIVATIVES

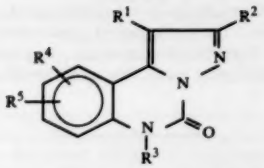
B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 820,289, Jul. 29, 1977. This application Jul. 19, 1978, Ser. No. 925,910

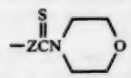
Int. Cl.[2] C07D *487/04;* **A61K** *31/505*

U.S. Cl. 424—248.5 **14 Claims**

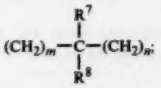
1. A compound of the structure



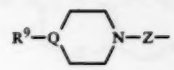
wherein R^1 represents hydrogen, lower alkyl, phenyl optionally substituted with R^4, R^2 is



wherein Z is a single bond or



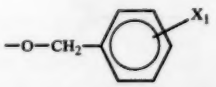
or



(wherein R^9 is hydrogen or alkyl, Q is CH or N);

R^3 is hydrogen, lower alkyl, benzyl or phenyl optionally substituted by an R^4 radical as defined below;

R^4 and R^5 may be the same or different and are hydrogen, lower alkyl, lower alkoxy, hydroxy, alkanoyloxy,



(X_1 is hydrogen, lower alkoxy, or NO_2);

R^7 and R^8 may be the same or different and represent hydrogen, lower alkyl, phenyl optionally substituted with X_1 or benzyl optionally substituted with X_1,

$(CH_2)_m$ and $(CH_2)_n$ represent a single bond or straight or branched chain alkylene radicals; and

m and n represent the number of carbons in the longest normal chain and may be the same or different and are 0 to 10, but m plus n is 10 or less,

and physiologically acceptable salts thereof.

7. A pharmaceutical composition for use in treating allergic conditions comprising an effective amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier thereof.

4,145,421

TREATING SPASTIC CONDITIONS

Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

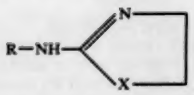
Filed Apr. 21, 1978, Ser. No. 898,558

Claims priority, application United Kingdom, Apr. 22, 1977, 16914/77; Apr. 22, 1977, 16915/77

Int. Cl.[2] A61K *31/495*

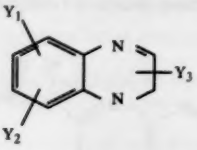
U.S. Cl. 424—250 **6 Claims**

1. A method of treating spastic conditions in animals or relaxing muscles in animals which comprises administering a therapeutically effective amount of a compound of formula I,



I

wherein X is imino and R is a radical of formula III,



wherein,

Y_1 and Y_2, independently, are hydrogen, halogen, alkyl, alkoxy, nitro, trifluoromethyl, cyano, hydroxy or alkylthio, and

Y_3 is hydrogen, alkyl or alkoxy,

in free base form or in pharmaceutically acceptable acid addition salt form thereof to an animal in need of such treatment.

4,145,422

AMINOMETHYLENE OXINDOLES

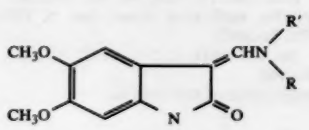
Martin Winn, Deerfield, and John J. Kyncl, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,722

Int. Cl.[2] A61K *31/495*; C07D *401/00, 403/00*

U.S. Cl. 424—250 **10 Claims**

1. A compound represented by the formula

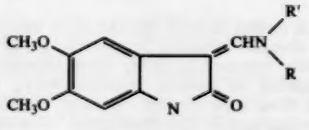


wherein R and R′ taken together form a chain of the formula

$$-CH_2CH_2NR''CH_2CH_2-$$

wherein R″ is alkoxycarbonyl.

4. A pharmaceutical composition comprising an active amount of a compound represented by the formula

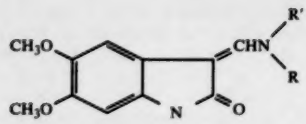


wherein R and R′ taken together form a chain of the formula

$$-CH_2CH_2NR''CH_2CH_2-$$

wherein R″ is alkoxycarbonyl, or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier.

7. A method of treating hypertension in a mammal comprising administering to a mammal so afflicted a therapeutically effective amount of a compound represented by the formula



wherein R and R′ taken together form a chain of the formula

$$-CH_2CH_2NR''CH_2CH_2-$$

wherein R″ is alkoxycarbonyl and the pharmaceutically acceptable acid addition salts thereof.

4,145,423

PYRIMIDINYL-1,2-DITHIOLE COMPOUNDS AND ANTI-BILHARZIA COMPOSITIONS THEREOF

Michel Barreau; Claude Cotrel, both of Paris, and Claude Jeanmart, Brunoy (Essonne), all of France, assignors to Rhone-Poulenc Industries, Paris, France

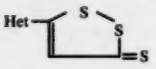
Division of Ser. No. 766,967, Feb. 9, 1977, Pat. No. 4,104,386. This application Nov. 17, 1977, Ser. No. 852,458

Claims priority, application France, Feb. 10, 1976, 76 03603; Nov. 30, 1976, 76 36038

Int. Cl.[2] C07D *239/06;* A61K *31/505*

U.S. Cl. 424—251 **6 Claims**

1. A 1,2-dithiole compound of the formula:



wherein Het represents a heterocyclic radical selected from pyrimidin-2-yl, pyrimidin-4-yl and pyrimidin-5-yl, or a said heterocyclic radical substituted by a halogen atom or by an alkyl radical of 1 through 4 carbon atoms, an alkoxy radical of 1 through 4 carbon atoms, the mercapto radical, an alkylthio radical of 1 through 4 carbon atoms or a dialkylamino group having 1 through 4 carbon atoms in each alkyl radical.

6. A pharmaceutical composition with anti-bilharzia activity which comprises an effective amount of a 1,2-dithiole compound as claimed in claim 1 in association with one or more compatible and pharmaceutically acceptable diluents or adjuvants.

4,145,424

1,4,4A-TRIMETHYL-1,2,4A,-4B,9A,10A-HEXAHYDRO-10H-BENZO[b]THIENO [2′,3′:4,3]CYCLOPENT-[1,2-b]-PYRIDINE

Ricardo G. Jarque, Barcelona; Mercedes A. Domingo, San Juan Despi; Juan Bosch Cartes, Barcelona; Cristobal M. Roldan, and Fernando R. Peinado, both of Madrid, all of Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Filed Mar. 14, 1978, Ser. No. 886,501

Claims priority, application Spain, Apr. 14, 1977, 457.778

Int. Cl.[2] A61K *31/44;* C07D *521/00*

U.S. Cl. 424—256 **2 Claims**

1. The compound 1,4,4a-trimethyl-1,2,4a,4b,9a,10a-hexahydro-10H-benzo [b] thieno [2′,3′:4,3]-cyclopent [1,2-b] pyridine (I) or a pharmaceutically acceptable acid addition salt thereof.

2. A pharmaceutical composition containing a pharmaceutically effective amount of the product of claim 1 as active ingredient along with a pharmaceutically acceptable inert carrier.

4,145,425

SUBSTITUTED (3-LOWERALKYLAMINO-2-R$_1$0-PROPOXY)PYRIDINES, THEIR PREPARATION AND USE

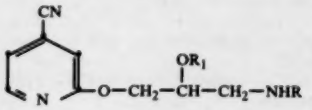
John J. Baldwin, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 696,235, Jun. 15, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 879,016

Int. Cl.[2] C07D *213/57;* A61K *31/44*

U.S. Cl. 424—263 **6 Claims**

1. Compound having the formula:



wherein:

R is C_3–C_4 branched alkyl and

R_1 is H,

and pharmaceutically acceptable salts thereof.

6. A method of treating hypertension in animals which comprises administering an effective amount of a compound of claim 1.

4,145,426

ANTI-MICROBIAL PIPERIDINO BUTAN-2-ONES

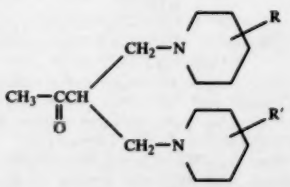
Nathaniel Grier, Englewood; Richard A. Dybas, Somerville, and Bruce E. Witzel, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 18, 1977, Ser. No. 816,613

Int. Cl.[2] A61K *31/445;* C07D *211/44, 211/32, 211/22*

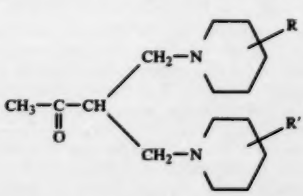
U.S. Cl. 424—267 **4 Claims**

1. A compound of the formula:



wherein R and R^1 are C_1 to C_3 alkyl, hydroxy, C_1 to C_3 hydroxyalkyl, phenyl, carboxy, carboxamido, N-loweralkylcarboxamido said alkyl having up to four carbon atoms, loweralkoxycarbonyl said alkoxy having up to four carbon atoms, 1-pyrrolidinyl and 1-piperidinyl, provided that R and R^1 are substituted at either the 3 or 4 position of the piperidine rings and further provided that said piperidine rings are identically substituted.

3. An antimicrobial composition comprising an antimicrobially effective amount of a compound of the formula:



wherein R and R^1 are C_1 to C_3 alkyl, hydroxy, C_1 to C_3 hydroxyalkyl, phenyl, carboxy, carboxamido, N-lower-alkylcarboxamido said alkyl having up to four carbon atoms, lower alkoxycarbonyl said alkoxy having up to four carbon atoms,

1-pyrrolidinyl and 1-piperidinyl, provided that R and R^1 are substituted at the 3 or 4 position of the piperidine rings and further provided that said piperidine rings are identically substituted.

4,145,427
N-[1-(3-BENZOYL-PROPYL)-4-PIPERIDYL]-SULFONIC ACID AMIDES AND SALTS THEREOF

Adolf Langbein; Karl-Heinz Weber, both of Gau-Algesheim, and Karin Böke, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

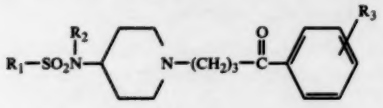
Filed Apr. 14, 1978, Ser. No. 896,575

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718405

Int. Cl.[2] A61K *31/18, 31/44;* **C07D** *211/96*

U.S. Cl. 424—267 **6 Claims**

1. A compound of the formula



wherein

R_1 is alkyl of 1 to 6 carbon atoms, phenyl, substituted phenyl, naphthyl or heteroaryl;

R_2 is hydrogen or lower alkyl; and

R_3 is hydrogen, methyl, methoxy or halogen;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. A neuroleptic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective neuroleptic amount of a compound of claim 1.

4,145,428
FUNGICIDALLY ACTIVE 2-ACYLOXY-1-PHENOXY-1-(1,2,4-TRIAZOLYL)-3,3-DIMETHYL-BUTANES

Wolfgang Krämer; Karl H. Büchel, both of Wuppertal; Wilhelm Brandes, Cologne, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

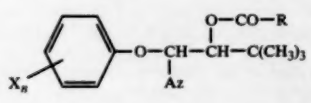
Filed Dec. 21, 1976, Ser. No. 753,651

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1976, 2600799

Int. Cl.[2] A01N *9/22;* **A61K** *31/41;* **C07D** *249/10*

U.S. Cl. 424—269 **9 Claims**

1. A 2-acyloxy-1-phenoxy-1-(1,2,4-triazolyl)-3,3-dimethyl-butane of the formula



(I)

in which

R represents straight-chain or branched alkyl with 1 to 8 carbon atoms, straight-chain or branched alkenyl or alkynyl, each with 2 to 4 carbon atoms, halogenoalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, cycloalkyl with 5 to 7 carbon atoms, or optionally substituted phenyl or phenoxyalkyl which is optionally substituted in the phenyl part and has up to 2 carbon atoms in the alkyl part, in either case the substituents being selected from halogens, amino, cyano, nitro and alkyl with 1 or 2 carbon atoms, or alkyl-amino or dialkylamino with 1 to 4 carbon atoms in each alkyl part, or phenylamino which may optionally be substituted by halogen, nitro or cyano;

X represents halogen, amino, cyano, nitro, straight-chain or branched alkyl with up to 4 carbon atoms, cycloalkyl with 5 to 7 carbon atoms, halogenoalkyl with up to 2 carbon atoms and up to 5 halogen atoms, alkoxy-carbonyl with a total of up to 5 carbon atoms, alkoxy or alkylthio each with up to 2 carbon atoms, phenyl or phenoxy, either of which may optionally carry one or more substituents selected from halogens, amino, cyano, nitro and alkyl with 1 to 2 carbon atoms, or phenylalkyl with 1 or 2 carbon atoms in the alkyl part, in which alkylcarbonyloxy with a total of up to 3 carbon atoms may be a substituent in the alkyl part and halogen, nitro or cyano may be a substituent in the phenyl part,

n represents 0, 1, 2 or 3, and

Az represents the 1,2,4-triazolyl-1 or the 1,2,4-triazolyl-4 radical,

in the form of the free base, a salt with a physiologically tolerated acid or a complex with a metal salt.

7. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,145,429
ORAL VETERINARY PREPARATIONS

Christopher D. Clarke, Worthing, England, assignor to Beecham Group Limited, Great Britain

Continuation of Ser. No. 611,005, Sep. 8, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,495

Claims priority, application United Kingdom, Sep. 21, 1974, 41231/74

Int. Cl.[2] A61K *31/43, 31/14, 47/00*

U.S. Cl. 424—271 **11 Claims**

1. In the treatment of a veterinary animal with an orally effective antibiotic, the improvement which comprises orally administering said antibiotic in veterinary fluid composition consisting essentially of from 1 to 15% w/v of an antibiotic, from 1 to 5% w/v of a natural or synthetic clay in which inorganic cations have been replaced with long chain aliphatic quaternary ammonium cations, from 0 to 2% w/v of a polar solvent and, as the balance, an edible vegetable oil.

11. In the treatment of a veterinary animal with an orally effective penicillin, the improvement which comprises orally administering veterinary fluid composition consisting essentially of from 1 to 15% w/v of said penicillin, from 1 to 5% w/v of a clay of the montmorillonite group in which organic cations have been replaced by a quaternary ammonium cation of the formula:

from about 0 to 2% of a polar solvent and, as the balance, an edible vegetable oil selected from the group consisting of sunflower oil, arachis oil, soyabean oil, rapeseed oil or maize oil.

4,145,430
BETA-LACTAM COMPOUNDS, PREPARATION AND USE

Eric Hunt, Betchworth, England, assignor to Beecham Group Limited, United Kingdom

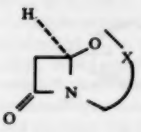
Filed Jul. 3, 1978, Ser. No. 921,738

Claims priority, application United Kingdom, Jul. 23, 1977, 31015/77

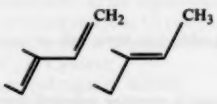
Int. Cl.[2] C07D *498/04;* **A61K** *31/42*

U.S. Cl. 424—272 **20 Claims**

1. A compound of the formula (I)

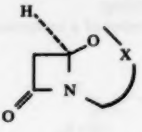


wherein X is a moiety of the sub-formula (a) or (b):



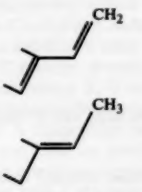
(a) (b)

15. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a compound of the formula (I):



(I)

wherein X is a moiety of the sub-formula (a) or (b):



(a)

or

(b)

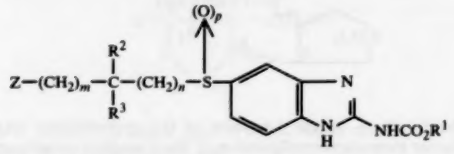
4,145,431

METHOD OF TREATING HELMINTHIASIS BY PARENTERAL ADMINISTRATION OF SULFIDE- AND SULFOXIDE-DERIVATIVES OF BENZIMIDAZOLES

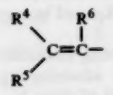
Rudiger D. Haugwitz, Titusville, and Larry R. Cruthers, Flemington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 16, 1978, Ser. No. 878,498
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—273 B 15 Claims

1. A method of treating helminthiasis, which comprises parenterally administering to a mammalian host an effective amount of a compound of the structure

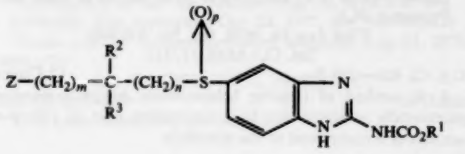


wherein R^1 is lower alkyl, phenyl-lower alkyl, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen and lower alkyl, Z is

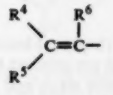


or R^4—C≡C— and R^4, R^5 and R^6 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl and phenyl, m is 0 to 3, n is 0 to 3 and m + n is ≦ 5 and p is 0 or 1, dispersed in a non-toxic non-pyrogenic physiologically acceptable carrier.

14. An injectable composition for use in treating helminthiasis in mammalian species comprising an effective amount of a compound of the structure



wherein R^1 is lower alkyl, phenyl-lower alkyl, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen and lower alkyl, Z is



or R^4—C≡C— and R^4, R^5 and R^6 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl and phenyl, m is 0 to 3, n is 0 to 3 and m + n is ≦ 5 and p is 0 or 1 and a non-toxic non-pyrogenic physiologically acceptable carrier therefor selected from the group consisting of benzyl benzoate, 1,3-butylene glycol, ethyl oleate, glyceryl triacetate, mixtures thereof, a mixture of benzyl benzoate and sesame oil, and sterile water for injection.

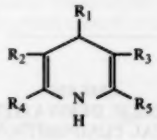
4,145,432

6-ACYLORYALKYL-1,4-DIHYDROPYRIDINE DERIVATIVES AND A METHOD OF EFFECTING VASODILATION THEREWITH

Yoshinari Sato, Takaishi, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 1, 1976, Ser. No. 701,994
Claims priority, application United Kingdom, Jul. 2, 1975, 27945/75; Sep. 29, 1975, 39854/75; Dec. 16, 1975, 51524/75; Apr. 5, 1976, 13761/76
Int. Cl.[2] A61K *31/455*; C07D *213/55*
U.S. Cl. 424—266 33 Claims

1. A compound of the formula:



wherein

R_1 is phenyl, nitrophenyl or halophenyl,

R_2 and R_3 are each lower alkoxycarbonyl or N-lower alkyl-N-phenyl(lower)alkylamino(lower)alkoxycarbonyl,

R_4 is lower alkanoyloxy(lower)alkyl, carboxyalkanoyloxy(-lower)alkyl, lower alkoxycarbonyl(lower)alkanoyloxy(-lower)alkyl, N-lower alkyl-N-phenyl(lower)alkylamino(-

lower)alkanoyloxy(lower)alkyl, chlorophenoxy(lower)alkanoyloxy(lower)alkyl and benzoyloxy(lower)alkyl, and R_5 is lower alkyl.

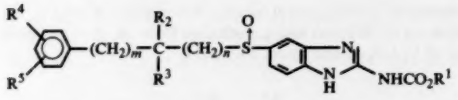
29. A method for effecting vasodilation in humans and mammals which comprises administering thereto an effective amount of the compound of claim 1.

4,145,433
METHOD OF TREATING HELMINTHIASIS BY PARENTERAL ADMINISTRATION OF SULFOXIDE DERIVATIVES OF BENZIMIDAZOLES

Rudiger D. Haugwitz, Titusville, and Larry R. Cruthers, Flemington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

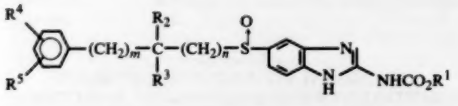
Filed Jan. 18, 1978, Ser. No. 870,410
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—273 B 12 Claims

1. A method of treating helminthiasis, which comprises parenterally administering to a mammalian host an effective amount of a compound of the structure



wherein R^1 is lower alkyl, phenyl-lower alkyl, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen and lower alkyl, and R^4 and R^5 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen and nitro, m is 0 to 3, n is 0 to 3 and m + n is $\leqq$ 5, dispersed in a non-toxic non-pyrogenic physiologically acceptable carrier.

10. An injectable composition for use in treating helminthiasis in mammalian species comprising an effective amount of a compound of the structure



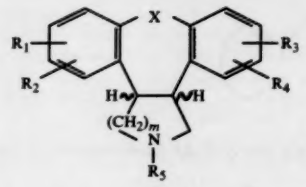
wherein R^1 is lower alkyl, phenyl-lower alkyl, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen and lower alkyl, and R^4 and R^5 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen and nitro, m is 0 to 3, n is 0 to 3 and m + n is $\leqq$ 5, and a non-toxic non-pyrogenic physiologically acceptable carrier therefor selected from the group consisting of benzyl benzoate, 1,3-butylene glycol, ethyl oleate, glyceryl triacetate, mixtures thereof, a mixture of benzyl benzoate and sesame oil, and sterile water for injection.

4,145,434
TETRACYCLIC DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS OF MATTER

Willem J. van der Burg, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed May 18, 1977, Ser. No. 798,222
Claims priority, application Netherlands, May 24, 1976, 7605526
Int. Cl.[2] C07D *209/58;* A61K *31/40*
U.S. Cl. 424—274 35 Claims

1. A compound of the formula



or a pharmaceutically acceptable non-toxic salt or nitrogen oxide thereof;

wherein:

R_1, R_2, R_3, and R_4 represent a member selected from the group consisting of hydrogen, hydroxy, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, and trifluoromethyl;

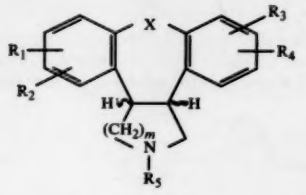
R_5 represents hydrogen, C_1–C_6 alkyl or aralkyl having from 7 to 10 carbon atoms;

X represents oxygen; and

m represents the number 1.

21. A pharmaceutical composition having sedative, depressive, and neuroleptic properties comprising:

(A) a pharmaceutically effective amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt or nitrogen oxide thereof;

wherein:

R_1, R_2, R_3, and R_4 represent a member selected from the group consisting of hydrogen, hydroxy, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, and trifluoromethyl;

R_5 represents hydrogen, C_1–C_6 alkyl or aralkyl having from 7 to 10 carbon atoms;

X represents oxygen; and

m represents the number 1, and

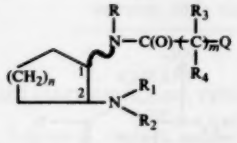
(B) a pharmaceutically acceptable carrier.

4,145,435
2-AMINOCYCLOALIPHATIC AMIDE COMPOUNDS

Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 12, 1976, Ser. No. 741,354
Int. Cl.[2] C07D *207/06;* A61K *31/40*
U.S. Cl. 424—274 28 Claims

1. A compound of the formula



(I)

wherein the ~ at the 1-position of the cycloaliphatic ring denotes trans-stereoconfiguration of the 1-position substituent with respect to the substituent in position 2 of the same cycloaliphatic ring;

R is C_1 to C_3-alkyl;

R_1 and R_2, taken separately, are C_1 to C_3-alkyl, or when R_1

is C_1 to C_3-alkyl, R_2 is C_1 to C_6-alkyl, $-CH_2CF_3$, C_3 to C_6-(allylic)alkenyl, C_2 to C_5-hydroxyalkyl, C_3 to C_6-cycloalkyl, C_3 to C_4-cycloalkylmethyl, phenyl-C_1 to C_3-alkyl, or R_1 and R_2 taken together with the nitrogen to which they are bonded complete a saturated, monocyclic, mononitrogen heterocyclic ring containing only carbon and nitrogen ring atoms and containing from 3 to 4 carbon atoms; said saturated monocyclic nitrogen heterocyclic rings having 3 to 4 ring carbon atoms permissively being substituted in the 3-position of the ring with hydroxy, C_1 to C_3-alkyloxy, or C_1 to C_3-alkanoyloxy; or N-piperazinyl ring, permissively substituted on the N'-nitrogen with a C_1 to C_3-alkyl;

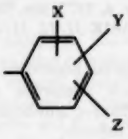
R_3 is hydrogen or methyl;

R_4 is hydrogen or methyl, or R_3 and R_4 can be taken together with the carbon to which they are bonded to complete a cyclopropylene ring;

m is 1 to 4 and is 2 to 4 only when R_3 and R_4 are both hydrogen;

n is 2 to 4; and

Q is 1-naphthyl, 2-naphthyl or



wherein each of X, Y and Z is hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_2 to C_3-alkyl, C_1 to C_3-alkyloxy, azido or phenyl, and at least one of X, Y and Z is a substituent other than hydrogen, and when one of X, Y and Z is azido, phenyl, C_1 to C_3-alkyloxy or trifluoromethyl, the remaining X, Y and Z moieties are hydrogen, and the pharmaceutically acceptable salts thereof.

22. A composition useful in pharmaceutically effective dosage unit form for alleviating pain in warm-blooded mammals which comprises a compound of formula I in claim 1 in combination with a pharmaceutically acceptable carrier.

4,145,436

ANTIMICROBIAL COMPOSITIONS AND METHOD FOR USING SAME

Edwin B. Michaels, Gregory Ct., East Norwalk, Conn. 06855

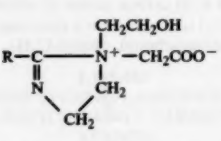
Filed Nov. 7, 1977, Ser. No. 849,031

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 R **11 Claims**

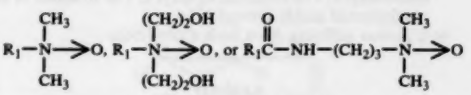
1. A broad spectrum, antimicrobial composition having both a pH ranging from about 4 to about 9.5 and low toxicity which consists essentially of:

(a) from 0.1 to 40 parts, by weight, of a higher alkylimidazolium betaine, said betaine having the structure:



where R is higher alkyl or mixed higher alkyl of from 10 to 18 carbon atoms, and

(b) from 0.1 to 40 parts, by weight, of a higher alkyl-N, N-dimethylamine oxide, a higher alkyl-N,N-dihydroxyethylamine oxide, or an acylamido t-amine oxide having the respective structure:



where R_1 is a higher alkyl or mixed higher alkyl of from 10 to 18 carbon atoms.

4,145,437

HYDROXY ACIDS

David C. Aldridge; Graham C. Crawley, and Colin J. Strawson, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

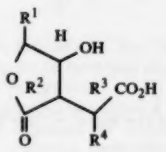
Continuation of Ser. No. 716,284, Aug. 20, 1976, Pat. No. 4,070,480. This application Oct. 25, 1977, Ser. No. 845,420

Claims priority, application United Kingdom, Aug. 21, 1975, 34842/75

Int. Cl.² C07D *307/32*; A61K *31/365*

U.S. Cl. 424—279 **6 Claims**

1. A mono-lactone of the formula:



[II]

wherein one of R^1 and R^2 is hydrogen, a C_{1-10}-alkyl or phenyl radical, and the other of R^1 and R^2 is hydrogen; one of R^3 and R^4 is hydrogen or a C_{1-6}-alkyl radical, and the other R^3 and R^4 is hydrogen; or R^3 and R^4 together form the methylene ($=CH_2$) radical or a pharmaceutically acceptable base addition salt thereof.

5. A pharmaceutical composition for use in the treatment of duodenal or gastric ulcers which comprises as active ingredient an effective amount of a compound as claimed in claim 1, or a pharmaceutically-acceptable base addition salt thereof, together with a pharmaceutically-acceptable diluent or carrier.

4,145,438

METHOD FOR TREATMENT OF ECZEMA OR PSORIASIS

Patrick J. Kingsley, Loughborough, and Thomas S. C. Orr, Melton Mowbray, both of England, assignors to Fisons Limited, London, England

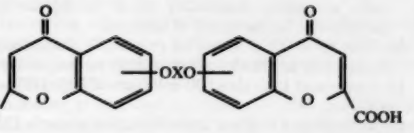
Division of Ser. No. 717,875, Aug. 26, 1976, Pat. No. 4,067,992. This application Oct. 20, 1977, Ser. No. 843,714

Claims priority, application United Kingdom, Sep. 10, 1975, 37183/75; Sep. 10, 1975, 37185/75

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **10 Claims**

1. A method of treatment of eczema or of psoriasis, which method comprises per os administration in an amount effective to ameliorate the symptoms thereof, of a compound of formula I,



I

wherein X is a polymethylene chain containing 3 to 7 carbon atoms inclusive, which chain may be substituted by an -OH group,

or a therapeutically acceptable salt, alkyl C 1 to 10 ester,

mono-alkyl C 1 to 10 amide, di-alkyl C 1 to 10 amide or an unsubstituted amide thereof,

to a patient suffering from such a condition.

4,145,439

COMBATING PESTS WITH BENZYL PHENYL ETHERS

Andreas Schulze, Cologne; Klaus Sasse, Berg.Gladbach; Klaus Naumann, Cologne; Peter Roessler, Berg.Gladbach, and Peter Kraus, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

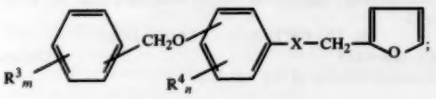
Filed Jun. 23, 1977, Ser. No. 809,492

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631948

Int. Cl.[2] **A01N** *9/28, 9/20;* **C07D** *307/14;* **C07C** *93/06*

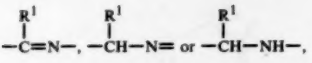
U.S. Cl. 424—285 **8 Claims**

1. A substituted benzyl phenyl ether of the formula



in which

X is



R^1 is H or methyl,

R^3 each independently is H, alkyl with 1–4 carbon atoms, alkoxy with 1–4 carbon atoms, halogen, trifluoromethyl, trichloromethyl, trifluoromethoxy, trifluoromethylmercapto or nitro,

R^4 each independently is H, halogen or alkoxy with 1 to 4 carbon atoms,

m is an integer from 1 to 5, and

n is an integer from 1 to 4,

or an acid addition salt thereof.

7. A method of combatting arthropods, nematodes, fungi or bacteria, which comprises applying to the arthropods, nematodes, fungi or bacteria, or to a habitat thereof, an arthropodicidally, nematicidally, fungicidally or bactericidally effective amount of a substituted benzyl phenyl ether according to claim 1 or an acid addition salt thereof.

4,145,440

LIQUID SUSPENSION OF AN ALUMINUM SALT OF IBUPROFEN

Kandy A. Fitch, and Englebert L. Rowe, both of Portage Township, Kalamazoo County, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 18, 1977, Ser. No. 825,572

Int. Cl.[2] **A61K** *47/00, 31/19, 31/28;* **C07F** *5/06*

U.S. Cl. 424—287 **9 Claims**

1. A pharmaceutical liquid suspension composition comprising, for each 100 ml. of suspension,

(a) from about 4 to about 17 grams of an aluminum salt of ibuprofen,

(b) from about 0.25 to about 2.25 grams of a pharmaceutically acceptable suspending agent having an average particle size below about 50 microns,

(c) from about 0.4 to about 0.8 grams of a pharmaceutically acceptable, essentially water soluble surface active agent,

(d) from about 10 to about 30 milliliters of 70% USP sorbitol solution,

(e) from about 5 to about 20 milliliters of glycerin USP, and

(f) water sufficient in amount to bring the liquid volume to 100 ml. of total liquid suspension.

2. A composition according to claim 1 wherein the suspending agent (b) is selected from the group consisting of

(1) a mixture of about 0.9 to about 1.4 weight percent of microcrystalline cellulose and about 0.1 to about 1 weight percent of sodium carboxymethylcellulose,

(2) about 0.25 to about 0.8 weight percent of a magnesium aluminum silicate powder, and

(3) mixtures of (1) and (2), so that the total weight of the suspending agent (1) and (2) mixture is not more than about 2.25 percent.

4,145,441

SYMPATHOMIMETIC AMINES EXHIBITING ANTI-HEMORRHOIDAL ACTIVITY

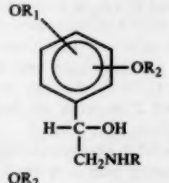
Nicholas S. Bodor, Lawrence, Kans., assignor to Interx Research Corporation, Lawrence, Kans.

Filed Nov. 4, 1977, Ser. No. 848,602

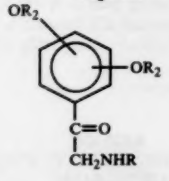
Int. Cl.[2] **A61K** *31/12, 31/24, 31/135*

U.S. Cl. 424—309 **42 Claims**

1. A method for reducing hemorrhoidal swelling in a warm-blooded animal which comprises rectally administering thereto, a safe but effective anti-hemorrhoidal amount of a compound having the formula:



(I)



(II)

wherein R represents hydrogen or a straight or branched C_1–C_5 alkyl group; and R_1 and R_2 which may be the same or different an acyl member which is alkanoyl having 1–22 carbon atoms, alkenoyl having one or two double bonds and having 4–22 carbon atoms, cycloalkyl-C_nH_{2n}

having a total of 4–10 carbon atoms of which 3–7 are carbon atoms in cycloalkyl and wherein n is zero, one, or two, phenoxyacetyl, naphthalenecarbonyl, phenyl-C_nH_{2n}

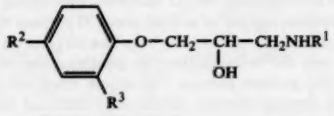
wherein n is zero, one or two and phenyl is unsubstituted or is substituted by 1–3 alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, halo, trifluoromethyl, dialkylamino having 2–8 carbon atoms, or alkanoylamino having 1–6 carbon atoms groups; and the nontoxic pharmaceutically acceptable acid addition salts thereof.

4,145,442
PHENOXY-HYDROXYPROPYLAMINES, THEIR PREPARATION, AND METHOD AND PHARMACEUTICAL PREPARATIONS FOR TREATING CARDIOVASCULAR DISEASES

Peder B. Berntsson, Vastra Frolunda; Arne E. Brandstrom, Goteborg; Enar I. Carlsson, Kungsbacka; Stig Å. I. Carlsson, Molnlycke; Lars Ek, Onsala; Benny R. Samuelsson, Pixbo; Sven E. Sjostrand, Kungsbacka; Gert C. Strandlund, Molndal, and Bengt A. H. Åblad, Goteborg, all of Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

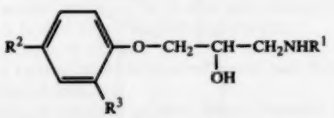
Continuation-in-part of Ser. No. 347,625, Apr. 4, 1973, Pat. No. 3,996,382. This application Aug. 31, 1976, Ser. No. 719,345
Claims priority, application Sweden, Apr. 4, 1972, 4321/72
Int. Cl.[2] A61K *31/135;* **C07C** *93/06*
U.S. Cl. 424—330 **40 Claims**

1. A compound of the formula



or a pharmaceutically acceptable non-toxic acid addition salt thereof, wherein R^1 is an alkyl or hydroxyalkyl radical of 1 to 4 carbon atoms; R^2 is selected from the group consisting of alkoxymethyl and alkoxyethyl in which the alkoxy part contains 1 to 4 carbon atoms; and R^3 is selected from the group consisting of halogen, alkenyl of 2 to 4 carbon atoms and alkoxymethyl having 2 to 4 carbon atoms.

14. A pharmaceutical preparation providing cardioselective antagonism to adrenergic β-receptor stimulation containing as an active ingredient a dosage unit effective to provide said cardioselective antagonism to adrenergic β-receptor stimulation, an ortho-para-substituted phenoxy-hydroxypropylamine compound of the formula



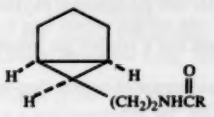
or a pharmaceutically acceptable non-toxic acid addition salt thereof, wherein R^1 is an alkyl or hydroxyalkyl radical of 1 to 4 carbon atoms; R^2 is selected from the group consisting of alkoxymethyl and alkoxyethyl in which the alkoxy part contains 1 to 4 carbon atoms; and R^3 is selected from the group consisting of halogen, alkenyl of 2 to 4 carbon atoms and alkoxymethyl having 2 to 4 carbon atoms, together wth a pharmaceutically acceptable carrier.

4,145,443
BICYCLO[3.1.0]HEXYLETHYLAMINOCARBONYL-SUBSTITUTED NAPHTHYLOXY CARDIOVASCULAR AGENTS

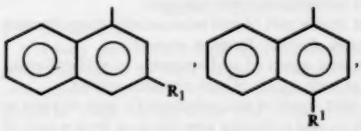
Karl G. Untch, Los Altos, and Stefan H. Unger, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

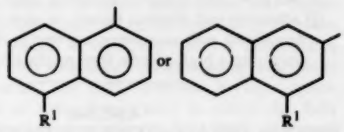
Filed Oct. 31, 1977, Ser. No. 846,952
Int. Cl.[2] C07C *103/29;* **A01K** *31/165*
U.S. Cl. 424—324 **14 Claims**

1. A compound of the formula



wherein R is





wherein R^1 is the radical $—OCH_2CH(OH)CH_2NHR^2$ wherein R^2 is C_1 to C_4 linear or branched alkyl, and the pharmaceutically acceptable salt thereof.

13. A pharmaceutical composition for treating cardiovascular disorders in mammals by blocking the beta-adrenergic receptor sites, consisting essentially of a pharmaceutically acceptable carrier and an amount effective to block said beta-adrenergic receptor sites of an agent selected from the group of compounds of claim 1.

4,145,444
ANTI-INFLAMMATORY AGENT OF BENZOYL DERIVATIVE

Yasuhiko Hamazaki, Yachiyo; Shozo Kawabata, Saitama; Toshiyuki Yamamoto, Tokyo; Yasuo Shiraishi, Tokyo, and Akira Ueno, Tokyo, all of Japan, assignors to Kaken Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 755,069, Dec. 28, 1976. This application Dec. 2, 1977, Ser. No. 856,919
The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.
Int. Cl.[2] C07C *49/76;* **A01N** *9/12*
U.S. Cl. 424—331 **1 Claim**

1. A method for reducing chronic inflammation in a mammal, which comprises: administering to said mammal a therapeutically acceptable amount of 4-n-butyl-benzophenone.

4,145,445
PROCESS FOR PROTEIN PRODUCTION

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 10, 1976, Ser. No. 722,196
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—60 **18 Claims**

1. A process for the preparation of protein-containing feed materials which comprises the steps of:

(a) converting a lower hydrocarbon of about 1 to 4 carbon atoms per molecule in a carbon dioxide-utilizing process at least in part to methanol, thereby producing a methanol-containing stream,

(b) culturing at least one methanol-utilizing microorganism under aerobic fermentation conditions employing said methanol as carbon and energy source, molecular oxygen-containing gases to maintain said aerobic fermentation conditions, assimilable nitrogen source, other nutrients, and water, thereby producing a product stream compris-

ing single cell protein, and an off-gas stream comprising carbon dioxide and unconsumed oxygen,

(c) separating said off-gas stream into a separated carbon dioxide stream and a residue gas stream containing oxygen,

(d) recycling said separated carbon dioxide at least in part to said converting step (a),

(e) recycling said residue gases containing oxygen at least in part to said culturing step (b),

(f) separating air into streams comprising substantially pure oxygen and substantially pure nitrogen,

(g) reacting at least a part of said substantially pure nitrogen with hydrogen, thereby forming ammonia,

(h) feeding at least a part of said ammonia to said culturing step (b) as at least a part of said nitrogen source,

(i) feeding at least a part of said substantially pure oxygen at least in part to said culturing step (b) as at least a part of said molecular oxygen-containing gases, and

(j) admixing said product stream, as such or at least in part dewatered, with supplementary feed components, thereby preparing a high-protein feed product.

4,145,446

PROCESS AND APPARATUS FOR PRODUCING A UREA FATTY ACID ADDUCT CONSISTING OF SOLID PARTICLES

Eva Kurucz; Piroska Lukacs; Lajos Kollar; Jozsef Barics; Jozsef Gulyas; Laszlo Zolna; Balazs Juhasz; Lajos Fodor; Sandor Gal; Janos Hollo; Ernö Pungor; Janisz Sztatisz, and Jenö Zolnay, all of Budapest, Hungary, assignors to Növényolajipari es Mososzergyarto Vallalat and Budapesti Müszaki Egyetem, both of Budapest, Hungary

Continuation-in-part of Ser. No. 661,498, Feb. 26, 1976, abandoned. This application May 2, 1977, Ser. No. 792,561

Int. Cl.[2] A23K *1/22*

U.S. Cl. 426—69 **9 Claims**

1. A process for the production of a urea-fatty acid adduct consisting of discrete solid particles which is suitable for the adjustment of the urea and fatty substance content of feed for ruminating animals, comprising preparing a solution or melt from urea with 0 to 45% water at 60° to 140° C., then reacting the solution or melt of urea with a fatty acid at 60° to 140° C., or a mixture of a liquid fatty acid and a neutral fat melted at 35° to 105° C., in a weight ratio of urea to fatty acid calculated on pure urea of between 40:60 and 60:40 in a reactor for a reaction period from about 2.5 to 10 seconds, and then spraying the reacted product into a spraying space wherein the sprayed particles proceeding in an air stream are allowed to remain therein until they crystallize and settle.

4,145,447

HIGHLY COMPACTED ANIMAL FOOD SYSTEM

Stanton E. Fisher, 16 Brentmoor Park, Clayton, Mo. 63105, and Bernard W. Weinrich, St. Charles, Mo., assignor to Bernard W. Weinrich by said Stanton E. Fisher, St. Louis, Mo.

Filed Mar. 22, 1973, Ser. No. 343,835

Int. Cl.[2] A23K *1/175*

U.S. Cl. 426—72 **24 Claims**

1. A process of preparing a hard, unit-integral, unitized, self-contained, compact chew-resistant animal food product comprising the steps of

(1) compacting animal food of a free flowing nature and containing sufficient water to wet said animal food without affecting its free flowing nature, prior to compacting, said water being present in said animal food in an amount of at least about 7.5% by weight of the components thereof dry, said compacting being carried out at a pressure of at least about 100 psi, and

(2) baking said so-compacted wet animal food at a temperature of at least about 200° F. for at least about 0.5 hour until said water is present in said animal food in the final amount of at least 5.5% by weight and said so-compacted animal food has a density of at least 0.5 oz/in^3.

4,145,448

CEREAL PROTEIN FORTIFIED FOOD BAR

James R. Hayward, McHenry; William L. Keyser, East Dundee, and Walter J. Zielinski, Ingleside, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 710,480, Aug. 2, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,902

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—72 **12 Claims**

1. A marshmallow based product consisting essentially of: marshmallow, low in reducing sugars and having incorporated therein, before the marshmallow is allowed to set to any degree, starch containing cereal material, said cereal material having a protein content of at least about 30 percent by weight, wherein said cereal material has been heated prior to its incorporation into the marshmallow to gelatinize the starch and denature the protein therein, but which does not have the nutritional content thereof substantially reduced due to the heating, and said cereal material further being coated with fat to prevent substantial water absorption thereby.

4,145,449

MULTI-COMPARTMENT FOOD PACKAGE

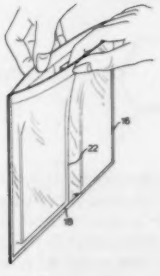
Roy W. Nelham, Cheltenham, Canada, assignor to R. Nelham & Associates Incorporated, Mississauga, Canada

Filed Jan. 12, 1978, Ser. No. 868,816

Claims priority, application United Kingdom, Jun. 13, 1977, 24659/77

Int. Cl.[2] B65D *25/08*

U.S. Cl. 426—120 **7 Claims**



1. A generally planar pouch-like package formed of overlying layers of heat-sealable flexible substantially air- and moisture-impervious material and having a generally rectangular shape with side edges and top and bottom edges,

said package comprising permanent heat seals at each side edge thereof along which said overlying layers are not separable, a first temporary, separable heat seal closing the top edge of the package, a heat seal closing the bottom edge of the package, and at least one additional temporary, separable heat seal extending continuously from said top edge to said bottom edge intermediate said side walls and separating the interior of the package into separate compartments containing packaged items,

said temporary, separable seals being so constructed that separation of the overlying layers may be effected therealong without otherwise damaging the integrity of the remainder of the package and the layers to permit opening of the package at said top edge to gain simultaneous access to the items packaged in said separate compartments and to permit formation of a single interior compartment by

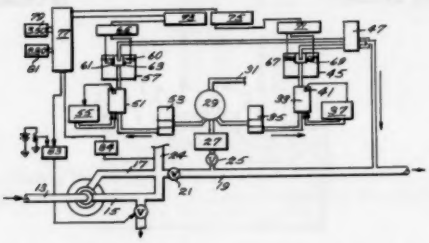
separation of the overlying layers along said at least one additional temporary, separable seal.

4,145,450

METHOD AND APPARATUS FOR CONTROLLING COMPOSITION OF MILK

William C. Winder, and Richard J. Wagner, both of Madison, Wis., assignors to Hartel Corporation, Fort Atkinson, Wis.

Filed Jun. 22, 1976, Ser. No. 698,782
Int. Cl.² A23C *9/00*
U.S. Cl. 426—231 **7 Claims**



1. A method of continuously controlling the butterfat content of a stream of milk comprising the steps of:

heating a first portion of said stream of milk to a first temperature,

heating a second portion of said stream of milk to a second temperature, said second temperature being different from said first temperature,

determining the rate at which a sound wave passes through said first portion of milk after said first portion is heated to said first temperature,

determining the rate at which a sound wave passes through said second portion of milk after said second portion of milk is heated to said second temperature,

deriving the level of butterfat in said milk from said determined rates at which said sound waves pass through said portions of milk, and

controlling in response to said desired butterfat level the quantity of cream mixed with said milk to give a predetermined level of butterfat therein.

4,145,451

PRESERVATION OF LOW ACID FOOD PRODUCTS IN THE ABSENCE OF CHEMICAL PRESERVATIVES

John G. Oles, Glenview, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Apr. 27, 1977, Ser. No. 791,173
Int. Cl.² A23L *1/24*
U.S. Cl. 426—321 **28 Claims**

1. A preserved food composition comprising a food and between 0 and about 60 percent by weight edible oil, between about 30 and about 96 percent by weight moisture, between 0 and about 30 percent by weight sweetener, as sucrose equivalent, balance food solids and a preserving system containing between about 0.05 and about 1.8 percent by weight, based on the total moisture content of the food composition, acetic acid, and between about 0.1 and about 1.5 percent by weight, based on the total moisture content of the food composition, phosphoric acid, the amount of phosphoric acid being based on the amount of moisture, sweetener, and acetic acid such that said food composition is preserved against microbiological spoilage in the absence of chemical preservatives.

4,145,452

FATTY SUBSTANCES OF QUASI-VITREOUS STRUCTURE

Charles M. Cousin, 215 Avenue Victor-Hugo, 62400 Bethune, and Patrick G. Cavroy, 29 Avenue Rapp, 75007 Paris, both of France

Continuation-in-part of Ser. No. 757,335, Jan. 6, 1977, abandoned, which is a continuation of Ser. No. 538,941, Jan. 6, 1975, abandoned. This application Oct. 19, 1977, Ser. No. 843,551
Claims priority, application France, Jan. 14, 1974, 74 01154
Int. Cl.² A23D *5/00*
U.S. Cl. 426—321 **22 Claims**

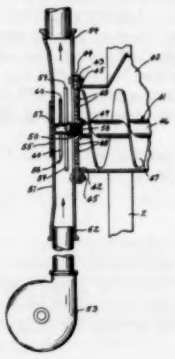
1. A fatty substances containing fatty constituents which are glyceridic esters of fatty organic acids, some of said fatty constituents being solid at room temperature and some being liquid at room temperature and being present in relative amounts such that the fatty substance normally has an essentially crystalline structure at room temperature, and higher polyholosides vegetable gum in amount providing between 0.01 and 1.5% by weight of said gum which is unassociated with water in said fatty substance, said gum being insoluble in said fatty constituents, said fatty substance having a quasi-vitreous structure at room temperature in which the fatty constituents are divided into small areas bounded by elongated chains of said gum.

4,145,453

METHOD FOR CONVEYING GROUND CHEESE

Roy A. Lenhardt, Sr., Fond du Lac, Wis., assignor to DEC International, Inc., Madison, Wis.

Division of Ser. No. 741,662, Nov. 15, 1976, Pat. No. 4,078,874, which is a continuation-in-part of Ser. No. 639,356, Dec. 10, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,080
Int. Cl.² B29F *3/00*; A23C *19/00*
U.S. Cl. 426—516 **3 Claims**



1. A method of conveying cheese, comprising the steps of grinding a mass of cheese, extruding the ground cheese through a multiplicity of holes in a die plate into a housing, contacting the extruded cheese with a first set of rotating blades to cut the extruded cheese into particles, contacting the cut cheese particles with a second set of rotating blades located in a different plane from said first set of blades to thereby agitate and suspend the cut particles in the housing, and flowing a stream of air vertically upward through the housing to entrain and convey the cheese particles in the upwardly moving air stream.

4,145,454

STABILIZED SPOONABLE ICE CREAM

Iain C. M. Dea, Bedford, and David J. Finney, Letchworth, both of England, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Oct. 5, 1977, Ser. No. 839,637

Claims priority, application United Kingdom, Oct. 6, 1976, 41602/76; May 25, 1977, 22069/77; May 27, 1977, 22532/77

Int. Cl.[2] A23G 9/02

U.S. Cl. 426—565 8 Claims

1. A hardened ice cream containing sufficient freezing point depressants that its log C at −20° C. is less than 2.8 and stabilised with (a) at least one stabilizer selected from the group consisting of locust bean gum and tara gum and (b) at least one stabilizer selected from the group consisting of xanthan gum, agar-agar and kappa-carrageenan.

4,145,455

MODIFIED PROTEIN COMPOSITIONS AND PREPARATION THEREOF

Masao Fujimaki, Tokyo; Soichi Arai, Yokohama; Michiko Watanabe, Matsudo; Yukio Hashimoto, Izumiotsu, and Akira Kurooka, Osaka, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Apr. 5, 1976, Ser. No. 673,885

Claims priority, application Japan, Apr. 4, 1975, 50-41599

Int. Cl.[2] A23J 3/00, 3/02

U.S. Cl. 426—614 7 Claims

1. A protein composition which is prepared by mixing a cysteine-enriched plastein containing about 5% by weight or more of half-cystine with a protein selected from the group consisting of plant seed protein, cow milk protein, animal meat protein, fish meat protein, egg protein and microorganism protein, in a ratio such that the amount of the cysteine-enriched plastein is at least 1% by weight based on the weight of the protein, dissolving or dispersing the resultant mixture in water, and heating the resultant solution or dispersion at a temperature of 40°–90° C.

4,145,456

METHOD OF PRODUCING INTERNALLY COATED GLASS TUBES FOR THE DRAWING OF FIBRE OPTIC LIGHT CONDUCTORS

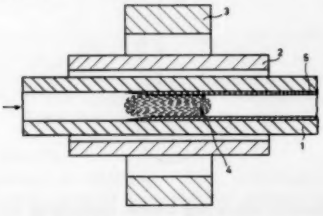
Dieter Küppers, Aachen; Hans Lydtin, Stolberg, and Ludwig Rehder, Aachen, all of Fed. Rep. of Germany

Continuation of Ser. No. 610,570, Sep. 5, 1975, abandoned. This application Nov. 16, 1977, Ser. No. 852,068

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1974, 2444100

Int. Cl.[2] B05D 3/06; C23C 11/00

U.S. Cl. 427—38 3 Claims



1. A method of producing internally coated glass tubes for drawing fiber optic light conductors which consists of a core and a jacket of glasses which have a mutually different refractive index, comprising the steps of introducing into a glass tube surrounded by a resonator a reactive gas mixture consisting of $SiCl_4$ and oxygen at a pressure of about 1 to 100 Torr, adding $GeCl_4$ to the gas mixture, moving the tube relative to the resonator to form a non-isothermal plasma zone within the tube, and heating the tube to a temperature between 800° C.–1200° C. to form a coating free of soot-like particles and consisting of a plurality of layers of SiO_2 doped with an increasing content of GeO_2.

4,145,457

METHOD FOR THE PRODUCTION OF OPTICAL DIRECTIONAL COUPLERS

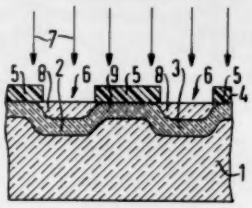
Ralf Kersten, Rottach-Egern, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 740,945, Nov. 11, 1976, abandoned. This application Mar. 28, 1978, Ser. No. 890,928

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553685

Int. Cl.[2] B05D 3/06

U.S. Cl. 427—38 10 Claims



1. A method for producing a layer-bound optical directional coupler at the surface of a substrate, said coupler comprising a substrate containing a pair of waveguide structures and having three regions, in the first of said regions the waveguide structures approach each other, in the second of said regions the waveguide structures are parallel to and closely spaced from each other and in the third of said regions the waveguide structures diverge from each other, said first and third regions being defined as boundary regions, said second region being defined as a coupling regions, said waveguide structures comprising optical pathways in said substrate defined by an increased index of refraction, said substrate in the coupling region also having an increased index of refraction between the waveguide structures, said method comprising the steps of:

masking the surface of the substrate to provide areas covered with masking material and open areas which outline the waveguide structures which are to be produced; and

bombarding the entire surface of the substrate with ions both through the open areas and through the areas covered with masking material to form the waveguide structures below the open areas of the mask having increased indices of refraction, and an area having an increased index of refraction between the waveguide structures and adjacent the surface to optically couple the waveguide structures.

4,145,458

METHOD OF PRODUCING INTERNALLY COATED GLASS TUBES FOR THE DRAWING OF FIBER-OPTIC LIGHT CONDUCTORS

Jos Koenings, Eys, and Dieter Küppers, Aachen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,672

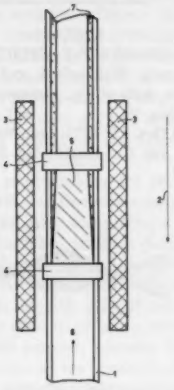
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642949

Int. Cl.[2] B05D 3/06

U.S. Cl. 427—39 3 Claims

1. A method for producing internally coated glass tubes for drawing fiber optical light conductors consisting of a core and a jacket of glasses having a mutually different refractive index, comprising the steps of passing a gas mixture containing only oxygen and a silicon halogenide through the tube to deposit a coating on the wall thereof, producing a plasma zone in the tube for energizing the reactive deposition, moving the tube

relative to a device which produces a plasma and superimposes a temperature zone on the plasma zone, and continuously



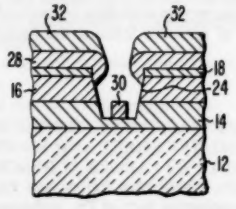
reducing the oxygen content of the gas mixture and/or the temperature of the tube wall while depositing the coating.

4,145,459

METHOD OF MAKING A SHORT GATE FIELD EFFECT TRANSISTOR

Jitendra Goel, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,701
Int. Cl.[2] H01L *21/28, 21/285, 21/302*
U.S. Cl. 427—88 **7 Claims**



1. A method of making a field effect transistor of the type having a short length gate on the bottom of a groove in a body of semiconductor material and source and drain regions on the surface of the semiconductor body at opposite sides of the groove, said method comprising the steps of,

(a) forming a groove in the surface of a body of semiconductor material,

(b) while protecting the bottom of the groove from having any metal deposited thereon, depositing metal layers on said surface of the semiconductor body at opposite sides of the groove so that the metal layers project partially across the groove until the spacing between the metal layers across the groove is substantially equal to the desired length of the gate, and

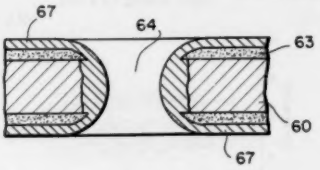
(c) depositing a metal gate film on the bottom of the groove with the metal layers on the surface of the semiconductor body serving as a mask to control the length of the gate film.

4,145,460

METHOD OF FABRICATING A PRINTED CIRCUIT BOARD WITH ETCHED THROUGH HOLES

Donald W. Finley, Falls Township, Bucks County, and Robert B. Lewis, Lower Makefield Township, Bucks County, both of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,461
Int. Cl.[2] B05D *5/12, 3/10, 1/32*
U.S. Cl. 427—97 **14 Claims**



9. A method of preparing a printed wiring board, which comprises:

(a) forming a patterned etch resist layer on a metal substrate;

(b) selectively etching said metal substrate to form a through hole with non-linear, undercut walls; and

(c) coating said etched substrate having said resist layer thereon with a dielectric powder to form a dielectric coat thereon having a sufficient through hole edge coverage.

4,145,461

PROCESS OF WARP SIZING WHICH USES A LOW MOLECULAR WEIGHT POLYESTER AND CHELATED TITANATE IN A WATER DISPERSION

Michael A. Lerman, Park Forest, and John C. Lark, St. Charles, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 739,241, Nov. 5, 1976, abandoned. This application Jan. 20, 1978, Ser. No. 871,104
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—155 **9 Claims**

1. A process for protecting a synthetic fiber comprising the step of sizing said synthetic fiber with an aqueous composition comprising:

(i) about 1% to 50% by weight, as based upon said composition, of a water-dispersible low molecular weight polyester having a number average molecular weight in the range of about 850–2500, and an acid value in the range of about 40–85 milligrams of KOH/gram of said polyester, which polyester comprises:

(1) a non-linear polyester backbone having an acid value in the range of about 5–15 milligrams of KOH/gram of said polyester backbone, said backbone comprising a reaction product of an aliphatic polyol, an aromatic dicarboxylic acid, and a monocarboxylic acid, and

(2) pendant moieties of a polycarboxylic acid attached to said polyester backbone by at least one ester linkage, wherein each of said pendant moieties has at least one free carboxylic acid group;

(ii) about 0.5% to 4% by weight, as based upon said polyester, of a chelated titanate, and

(iii) a fugitive base, in a quantity sufficient to produce a pH for said aqueous composition in the range of about 7–13.

4,145,462

PROCESS FOR PRODUCING SOLAR COLLECTORS

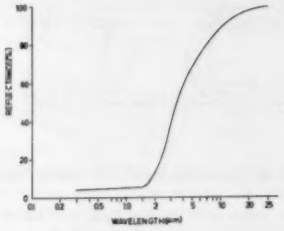
Masamichi Kuwabara, Yao; Mitsuo Sasaki, Tondabayashi; Sigeru Uema, Yao; Youkichi Taniguchi, Nara; Noboru Fukuchi, Kashiwara, and Tohru Kimura, Nara, all of Japan, assignors to Toyo Aluminium Kabushiki Kaisha, Japan

Filed May 25, 1977, Ser. No. 800,555

Claims priority, application Japan, Jun. 9, 1976, 51/69116; Jun. 19, 1976, 51/72657

Int. Cl.[2] B05B *5/00;* F24J *3/02;* C23F *7/00*

U.S. Cl. 427—160 5 Claims



1. A process for manufacturing solar collectors which consists essentially of the step of dipping aluminum or aluminum alloy in a hot alkaline aqueous solution containing 5–100 mg, in terms of SiO_2, of a silicate per liter of water, whereby there is formed a selective absorption coating thereon, wherein said hot aqueous solution further contains at least one kind of ions selected from the group consisting of zinc, magnesium, calcium, strontium and beryllium in the amounts of 3–30 mg/l, 5–35 mg/l, 1–20 mg/l, 1–20 mg/l and 1–20 mg/l, respectively.

4,145,463

FLAMEPROOFING OF TEXTILES

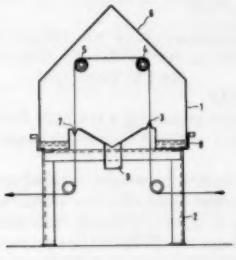
Robert Cole, Dudley, England, assignor to Albright & Wilson Limited, Worcester, England

Filed Aug. 20, 1973, Ser. No. 389,487

Claims priority, application United Kingdom, Aug. 21, 1972, 38845/72; Feb. 9, 1973, 06490/73

Int. Cl.[2] B05D *3/04, 3/10*

U.S. Cl. 427—337 15 Claims



1. A process for flameproofing cellulosic fabrics in a closed chamber, wherein the fabric is impregnated with an aqueous solution of a tetrakis hydroxymethyl phosphonium salt, comprising in combination

passing said impreganted fabric through said closed chamber;

introducing gaseous ammonia into said chamber through at least one duct having one or more orifices and passing said impregnated fabric in contact with said duct and over said orifices; said orifices being so positioned that the gaseous ammonia passing through said orifices contacts said impregnated fabric and passes through said impregnated fabric; and

passing condensed water formed in said chamber to a water-receiving means without said water contacting said impregnated fabric.

4,145,464

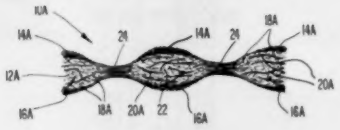
ABSORBENT ARTICLES

Albert L. McConnell, Wallingford, and Richard W. Schutte, Newtown Square, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 15, 1976, Ser. No. 732,776

Int. Cl.[2] B32B *5/14, 5/16*

U.S. Cl. 428—171 6 Claims



1. An absorbent structure including a dry-formed fibrous section including a preponderance, by weight, of short cellulosic fibers that are in the length range of from between about 1.2 millimeters and about 6.35 millimeters and that are of a size that would be retained on a 14 mesh screen, said fibrous section including opposed major surfaces and being embossed to provide a plurality of low density, high loft regions and high-density, compressed regions disposed over substantially the entire extent of the fibrous section, a liquid-transmitting layer formed of particuate material that maintains its particulate form when contacted with liquids and that is added to both major surfaces of the fibrous section, said particulate material being chemically bonded together and at least 50% of the particles in each layer, by weight, being of a size that will pass through a 48 mesh screen, said layers of particulate material having a density greater than that of the fibrous section and the particulate material in the layers being located between fibers at and adjacent the associated surfaces of the fibrous section to form a zone in which particulate material and fibers are intermixed, said particulate layers being adapted to wick liquids laterally for subsequent absorption into dry regions of the fibrous section and said fibrous section including an internal region that is substantially free of particles forming the liquid transmitting layers.

4,145,465

BACKING-FREE MASSIVE THICKNESS PRESSURE SENSITIVE ADHESIVE SHEET AND BONDING RIGID OBJECTS TO LARGER SURFACES

Frank T. Sanderson, Huntingdon Valley, and Richard E. Zdanowski, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 117,159, Feb. 19, 1971, abandoned, Ser. No. 108,819, Jan. 22, 1971, Pat. No. 3,740,366, which is a continuation-in-part of Ser. No. 80,132, Oct. 12, 1970, abandoned, Ser. No. 19,571, Mar. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 819,598, Apr. 28, 1969, abandoned. This application Nov. 2, 1973, Ser. No. 412,231

Int. Cl.[2] B60R *13/02, 13/04*

U.S. Cl. 428—31 21 Claims

1. In a process of adhering a substantially rigid object to a larger solid surface to which it conforms, the improvement of applying to said object or said surface a backing-free sheet consisting of a permanently pressure sensitive adhesive composition comprising a crosslinked addition polymer or a crosslinked addition polymer containing a finely divided bodying agent having a particle size of less than 25 microns, said adhesive having the resilience of a soft rubber, a thickness of 8 mils to 125 mils, a Tg of below 0° C., a tensile strength of from about 15 to 60 psi, and a percent elongation at break of from 500 to 3000 percent, and applying said object to said surface

with the adhesive sheet therebetween, whereby said object is permanently adhered to said surface.

8. An adhesive product consisting essentially of a backing-free layer of pressure sensitive adhesive on a release coated surface, the adhesive comprising a crosslinked addition polymer or a crosslinked addition polymer containing a finely divided bodying agent having a particle size of less than 25 microns, said adhesive having the resilience of a soft rubber, a thickness of 8 mils to 125 mils, a Tg of below 0° C., a tensile strength of from about 15 to 60 psi, and a percent elongation at break of from 500 to 3000 percent.

11. A substantially rigid applique for an automobile body, said applique having adhered thereto a relatively massive layer of pressure sensitive adhesive comprising a crosslinked addition polymer or a crosslinked addition polymer containing a finely divided bodying agent having a particle size of less than 25 microns, said adhesive having the resilience of a soft rubber, a thickness of 8 mils to 125 mils, a Tg of below 0° C., a tensile strength of from about 15 to 60 psi and a percent elongation at break from 500 to 3000 percent, whereby the adhesive compensates for irregularities of the applique or the automobile body and absorbs and cushions vibrations and blows applied to said applique.

4,145,466

MELT STRENGTH IMPROVEMENT OF PET

John P. Leslie, Levittown; Constance A. Lane, Philadelphia, and R. Peter Grant, Newtown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 2, 1977, Ser. No. 830,240

Int. Cl.[2] B29C *17/07*

U.S. Cl. 428—35 **9 Claims**

1. A method for preparing thin-walled shaped articles comprising:

(a) extruding a composition comprising PET and about 0.1 to 5% by weight of a polyanhydride selected from the group consisting of pyromellitic dianhydride, mellitic trianhydride, tetra hydrofuran dianhydride, and polyanhydride containing at least two unsubstituted or substituted phthalic anhydride radicals to a molten self-supporting preform wherein said polyanhydride causes increased melt strength;

(b) shaping said molten composition into a final non-crystalline form;

(c) allowing said composition to cool to a shaped article.

5. Clear amorphous blow-molded bottles prepared by the process of claim 1.

4,145,467

WOVEN TEXTILE

Kuldip R. Malik, Waynesboro, Va., assignor to Thiokol Corporation, Newtown, Pa.

Continuation of Ser. No. 583,001, Jun. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 493,185, Jul. 30, 1974, abandoned. This application Oct. 17, 1977, Ser. No. 843,099

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—91 **52 Claims**

1. A woven polyolefin secondary backing comprising warp members and fill members, one of said warp and fill members comprising polyolefin ribbon from 0.5 to 4 mils thick, the other of said warp and fill members comprising heavily fibrillated polyolefin ribbon, the fibrils in said ribbon being from 3 to 235 denier and having an average denier of from about 12 to about 150, the backing characterized by a tensile strength greater than 30 pounds in the ribbon direction and greater than 25 pounds in the fibrillated ribbon direction and a delamination strength greater than 7.5 pounds.

4,145,468

COMPOSITE FABRIC COMPRISING A NON-WOVEN FABRIC BONDED TO WOVEN OR KNITTED FABRIC

Takahisa Mizoguchi; Hiroshi Henmi; Tsukasa Shima; Yasuhiko Yamashita; Shinichi Uematsu, all of Nobeoka, and Kazuo Kawamura, Kyoto, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1977, Ser. No. 764,132

Claims priority, application Japan, Jan. 30, 1976, 51-8386; May 28, 1976, 51-61285; Aug. 27, 1976, 51-101686; Sep. 16, 1976, 51-109803

Int. Cl.[2] D06N *3/00*

U.S. Cl. 428—239 **15 Claims**

1. A composite fabric comprising a woven or knitted fabric constituent and at least one non-woven fabric constituent consisting of numerous fibrous bundles composed of a plurality of individual fibers arranged parallel to each other, and varying in the number of said individual fibers from which said bundles are formed, and numerous individual fibers independent from each other and from said fibrous bundles, said individual fibers and said fibrous bundles having a length of 15 mm or less and being randomly distributed and entangled with each other to form a body of non-woven fabric, and said non-woven fabric constituent and woven or knitted fabric constituent being superimposed and bonded together, to form a body of composite fabric, in such a manner that portions of said individual fibers and said fibrous bundles of said non-woven fabric constituent penetrate into the inside of said woven or knitted fabric and are entangled with a potion of fibers in said woven or knitted fabric constituent.

4,145,469

WATER-INSOLUBLE TREATED TEXTILE AND PROCESSES THEREFOR

David D. Newkirk, and Robert B. Login, both of Woodhaven, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 11, 1977, Ser. No. 841,165

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—245 **16 Claims**

1. A process for preparing a water-insoluble polyester product on a textile substrate comprising:

(a) forming a first aqueous solution comprising a cross-linking agent and at least one water-soluble phosphate group-containing branched chain polyester having $-PO_3M$ units wherein said units form an integral part of the polyester chain, and wherein M is selected from the group consisting of an alkali metal, ammonia, an amine, and combinations thereof,

(b) coating or impregnating a textile substrate with said aqueous solution of polyester and cross-linking agent reactants,

(c) heating the resultant substrate to cross-link said reactants and

(d) exposing said substrate to a second aqueous solution containing about 0.05% to about 2% by weight, based upon the weight of said polyester present on said substrate, of a polyvalent metal ion reactive with said phosphate groups in said polyester.

10. A process for preparing a water-insoluble polyester product on a textile substrate comprising:

(a) forming a first aqueous solution comprising at least one

water-soluble phosphate group-containing, branched chain polyester having $-PO_3M$ units wherein said units form an integral part of the polyester chain, and wherein M is selected from the group consisting of an alkali metal, ammonia, an amine, and combinations thereof,

(b) coating or impregnating a textile substrate with said aqueous solution of polyester,

(c) drying the resultant substrate and

(d) exposing said substrate to a second aqueous solution comprising about 0.05% to about 2% by weight, based upon the weight of said polyester present on said substrate, of a polyvalent metal ion reactive with said phosphate groups in said polyester.

4,145,470

FILM RESISTOR HAVING A REDUCED TEMPERATURE COEFFICIENT OF RESISTANCE

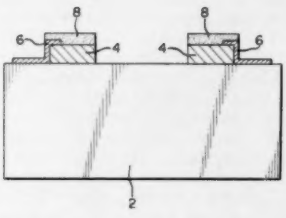
Masaaki Matsuura, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 29, 1977, Ser. No. 792,107

Claims priority, application Japan, May 6, 1976, 51-50791

Int. Cl.[2] H01C *1/034, 7/102*

U.S. Cl. 428—336 **11 Claims**



1. A film resistor having a low temperature coefficient of resistance comprising a substrate of insulative material, a film of Cermet formed on the substrate as a resistance, and a protective film of insulative material formed on the Cermet film to reduce the temperature coefficient of resistance, the protective film being formed of magnesium fluoride (MgF_2).

4,145,471

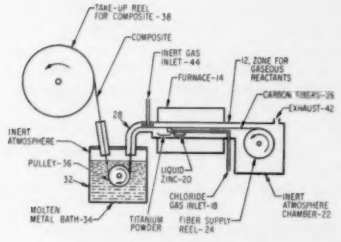
REINFORCED METAL MATRIX COMPOSITE

Ernest G. Kendall, El Segundo, Calif., and Roger T. Pepper, Cape Elizabeth, Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Division of Ser. No. 480,090, Jun. 17, 1974, Pat. No. 4,082,864. This application Oct. 22, 1975, Ser. No. 624,809

Int. Cl.[2] D02G *3/00*

U.S. Cl. 428—366 **8 Claims**



1. A carbon fiber reinforced metal matrix comprising:

a continuous multifilament carbon fiber;

a metal boride film coating substantially all surfaces of the carbon fiber; and,

a metal matrix material infiltrated throughout and adhered to the multifilament fiber.

4,145,472

FIBROUS CARBONACEOUS MATERIAL SIZED WITH A GLYCIDYLHYDANTOIN SIZING

Raymond G. Spain, Huntington Beach, and Albert L. Miller, Torrance, both of Calif., assignors to HITCO, Irvine, Calif.

Filed Sep. 6, 1977, Ser. No. 830,845

Int. Cl.[2] D02G *3/00*

U.S. Cl. 428—367 **12 Claims**

1. Carbon fibers having a water soluble sizing thereon consisting of 1,3-diglycidyl-5,5-dimethylhydantoin.

4,145,473

ANTISTATIC FILAMENT HAVING A POLYMERIC SHEATH AND A CONDUCTIVE POLYMERIC CORE

Harry V. Samuelson, Wilmington, Del., and Dean H. Smiley, Hixson, Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1975, Ser. No. 552,869

Claims priority, application Italy, Feb. 5, 1976, 19508 A/75

Int. Cl.[2] D02G *3/00*

U.S. Cl. 428—373 **14 Claims**

1. An antistatic filament comprising a sheath of a fiber-forming synthetic polymer selected from the class of polyamides, polyesters and polyolefins and a core consisting essentially of an amorphous fluid-like organic polymer having a log R_s of less than 10 and a glass transition temperature as measured by nuclear magnetic resonance, Tg (NMR) of less than 25° C., and selected from the group consisting of N-alkyl polyamides; polyether-esters; and ionically modified N-alkyl polyamides; ionically modified polyether-esters; and ionically modified aliphatic polyesters, with said ionically modified polymers having the ionic modifier copolymerized therewith, the said core constituting less than about 10% of the cross-sectional area of the filament.

4,145,474

METHOD OF MANUFACTURING INSULATED ELECTRIC WIRE OF THE ENAMELLED-WIRE TYPE BY EXTRUSION

Eberhard Kertscher, Romanel, Switzerland, and Harald Janssen, Hamburg, Fed. Rep. of Germany, assignors to Maillefer S.A., Ecublens, Switzerland and Dr. Beck & Co. AG, Hamburg, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 811,364

Claims priority, application Switzerland, Jul. 1, 1976, 8445/76

Int. Cl.[2] B29F *3/10*

U.S. Cl. 428—379 **9 Claims**

1. A method of manufacturing insulated electric wire of the enamelled wire type intended to be used in the manufacture of windings for electrical equipment such as motors, transformers, magnetic coils, relays and the like required to operate under load conditions wherein their temperature is elevated above the ambient temperature, comprising the steps of intro-

ducing into an extruder a solvent free thermoplastic material containing at least one partially crystalline thermoplastic polycondensate comprising crystallites having a melting point above 170° C.and extruding at or above the crystalline melting point of said thermoplastic polycondensate, the molten material onto and around a metal wire so as to form on said wire a thin sheath having a thickness complying with the requirements of German Standard DIN 46 435.

4,145,475

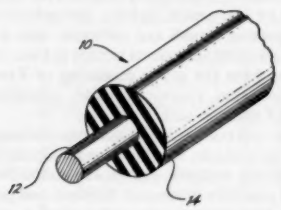
FLAME AND HEAT RESISTANT ETHYLENE-PROPYLENE RUBBER AND CONDUCTOR PRODUCT INSULATED THEREWITH

Joseph E. Vostovich, Bridgeport, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 842,695, Oct. 17, 1977, Pat. No. 4,125,509, which is a continuation-in-part of Ser. No. 576,555, May 12, 1975, Pat. No. 4,069,190. This application Jul. 17, 1978, Ser. No. 925,029

Int. Cl.[2] B32B *9/00, 15/00*

U.S. Cl. 428—389 **4 Claims**



1. An electrical conductor insulated with a cured etylene-propylene rubber having improved resistance to flame and heat and having apt electrical and physical properties, consisting essentially of a metal conductor having thereon an insulating composition of the crosslink cured product, in approximate parts by weight, of:

Ethylene-Propylene Rubber	100
Chlorosulfonated Polyethylene	3 - 10
Zinc Oxide	15 - 30
Hydrated Alumina	35 - 100
Vinyl Silane	1 - 3
Amorphous Silica	35 - 100
Antimony Oxide	2 - 10
Antioxidant	0.5 - 6
Peroxide Curing Agent	2 - 8
Curing Coagent	0 - 3

4,145,476

Patent Not Issued For This Number

4,145,477

RIGIDIZED ACRYLIC ARTICLES AND METHOD

Leonard H. Smiley, Jenkintown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 11, 1974, Ser. No. 522,383

Int. Cl.[2] B32B *17/10*

U.S. Cl. 428—441 **7 Claims**

1. A composite of an acrylic substrate or gel coat coated with a cured rigidizing composition, said rigidizing system applied to at least one side of said acrylic substrate or gel coat and comprising, in its uncured state, an acrylic thermoplastic polymer dissolved in an acrylic monomer, a cross-linking monomer, hydrated alumina and fibrous reinforcement.

4,145,478

CALCIUM OXIDE OR HYDROXIDE TO IMPROVE THE CHARGE ACCEPTANCE OF ELECTROGRAPHIC DIELECTRIC RESINS

Gerson E. Beauchamp, Parkridge, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 28, 1977, Ser. No. 819,849

Int. Cl.[2] G03G *5/022;* **H01B** *3/10, 3/42, 3/44*

U.S. Cl. 428—481 **3 Claims**

1. An electrographic dielectric layer having improved charge accepting capacity consisting essentially of a layer of organic solvent-soluble thermoplastic insulating resin having carboxyl functionality providing an acid value of from 5-100, and calcium oxide or calcium hydroxide dispersed in said layer in an amount of from 0.05-3% of the weight of said resin.

4,145,479

HEAT RESISTANT CURABLE SURFACE COATING COMPOSITION COMPRISING THE REACTION PRODUCT OF AN UNSATURATED POLYARYLOXYPHOSPHAZENE AND AN UNSATURATED ARYLOXYCYCLOTRIPHOSPHAZENE

Bruce E. Adams, Landisville; Robert D. Hensel, Millersville, and Edwin J. Quinn, Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jul. 6, 1978, Ser. No. 922,309

Int. Cl.[2] B32B *27/16, 27/18;* **C08L** *43/02, 47/00*

U.S. Cl. 428—500 **9 Claims**

1. A thermoplastic floor covering coated with a curable wear layer composition comprising the reaction product of at least one unsaturated polyaryloxyphosphazene, at least one unsaturated aryloxycyclotriphosphazene, and a crosslinking agent.

8. A curable coating composition comprising the reaction product of at least one unsaturated polyaryloxyphosphazene, at least one unsaturated aryloxycyclotriphosphazene, and a crosslinking agent.

9. A cured coating produced by curing, under free radical conditions, a composition comprising the reaction product of at least one unsaturated polyaryloxyphosphazene, at least one unsaturated aryloxycyclotriphosphazene, and a crosslinking agent.

4,145,480
PHOTOGRAPHIC PAPER SUPPORT

You Kusama, and Yoshinori Harikae, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

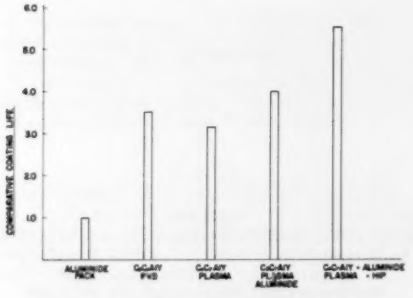
Filed Jun. 21, 1977, Ser. No. 808,547
Claims priority, application Japan, Jun. 24, 1976, 51-74772
Int. Cl.[2] G03C *1/92, 1/86;* B32B *27/32, 29/06*
U.S. Cl. 428—513 9 Claims

1. A photographic paper support comprising a base paper both surfaces of which are coated with polyolefin resins, characterized in that at least one polyolefin resin layer contains titanium oxide composition which comprises 20–60 parts by weight of a rutile-type titanium oxide and 40–80 parts by weight of an anatase-type titanium oxide per 100 parts by weight of the titanium oxide composition.

4,145,481
PROCESS FOR PRODUCING ELEVATED TEMPERATURE CORROSION RESISTANT METAL ARTICLES

Dinesh K. Gupta; Louis E. Dardi, both of Muskegon, and William R. Freeman, Jr., North Muskegon, all of Mich., assignors to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Aug. 3, 1977, Ser. No. 821,546
Int. Cl.[2] B05D *3/06*
U.S. Cl. 428—678 8 Claims

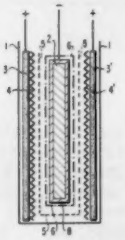


1. In a process for providing a coating on a metallic substrate, the coating renderng the substrate resistent to corrosion at elevated temperatures, said process comprising the steps of providing a ductile metallic overlay on the substrate surface, said overlay being of a composition normally resistant to corrosion at elevated temperatures, and applying an outer layer on said overlay, said outer layer being formed of a material more resistant to corrosion at elevated temperatures, the outer layer comprising an encapsulating means thereby preventing penetration of gas, the improvement comprising the steps of thereafter subjecting said coated substrate to a hot isostatic pressing operation by locating the coated substrate in a pressure-tight chamber, and subjecting the coated substrate to a temperature and pressure applied through a gaseous atmosphere sufficient to eliminate porosity, said temperature and pressure application also causing diffusion of substrate ingredients from one direction into the overlay and diffusion of outer layer ingredients from the other direction into the overlay thereby modifying the composition of the coating composed of said overlay and said outer layer.

4,145,482
GALVANIC CELL HAVING RECHARGEABLE ZINC ELECTRODE

Klaus von Benda, Kemnat, Fed. Rep. of Germany, assignor to Firma Deutsche Automobilgesellschaft mbH, Fed. Rep. of Germany

Continuation of Ser. No. 576,023, May 9, 1975, abandoned, which is a continuation of Ser. No. 375,818, Jul. 2, 1973, abandoned. This application Apr. 5, 1977, Ser. No. 784,809
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1972, 2232055
Int. Cl.[2] H01M *4/00*
U.S. Cl. 429—27 34 Claims



1. A galvanic cell comprising at least one rechargeable zinc anode, at least one cathode, alkaline electrolyte and at least one foraminous, wettable, electrically-conductive, coarse-pored auxiliary structure interposed between and galvanically separated from respective anodes and cathodes, said at least one auxiliary structure containing on its surface at least one electrocatalyst selected from the group consisting of Raney nickel, finely divided platinum, tungsten carbide, amorphous nickel-boron alloys and titanium-nickel alloys.

25. A galvanic cell comprising at least one rechargeable zinc anode, at least one cathode, alkaline aqueous electrolyte, and at least one foraminous, wettable, electrically conductive, coarse-pored auxiliary structure interposed between and galvanically separated from respective anodes and cathodes, said at least one auxiliary structure containing on its surface at least one to metal-containing electrocatalyst that has such low hydrogen overvoltage that there is no visible zinc deposition on said auxiliary structure during charging and discharging at a current density of at least 40 milliamperes/cm^2 whereby contacting zinc is oxidized and dissolved in the electrolyte and whereby hydrogen is generated during the oxidation, said hydrogen escaping from the at least one coarse-pored auxiliary structure.

4,145,483
ACCUMULATORS INCLUDING HALOGEN ELECTRODES OPERATING WITH FUSED HALIDE BASED ELECTROLYTES

Maurice Bonnemay, Boulogne-Billancourt; Guy Bronoël, Versailles; Suzanne Maximovitch nee Fabre, Meudon, and Joël Sarradin, Elancourt-Trappes, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Sep. 13, 1977, Ser. No. 832,996
Claims priority, application France, Sep. 13, 1976, 76 27508
Int. Cl.[2] H01M *10/39*
U.S. Cl. 429—103 17 Claims

1. Accumulator comprising in combination:
an electrolyte based on fused salts comprising at least a metal halide and a halide or a mixture of halide, of at least one alkaline metal,
a metal anode and
a halogen cathode based on graphite derivatives of the formula: A C_x, in which A represents a product able to be introduced into the graphite lattice cell and constituted in

particular by a compound M_yB_z in which M represents a metal, B represents an atom of halogen, of oxygen, of sulphur or an oxyhalide group, y and z representing the indices corresponding to the stoechiometry in said compound, x represents the number of carbon atoms of the compound, this number not being able to exceed a value corresponding to the saturation of the graphite by the compound A, wherein said electrolyte does not consist of fused salts of $Al Cl_3$ and an alkaline metal chloride when said compound M_yB_z is $W Cl_6$ or $Al Cl_3$,

said graphite derivatives being capable of storing in their structure the halogens formed by oxidation of the halide ions of the electrolyte on charging the accumulator and releasing in the electrolyte said halogens on discharging the accumulator, the storage and release of halogens having to be effected in amounts enabling the production of a discharge current density which is industrially useful.

4,145,484

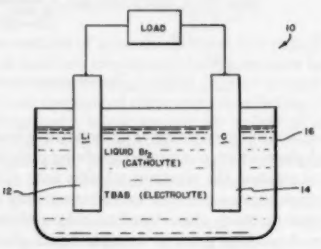
SAFE HIGH ENERGY DENSITY BATTERY

Forrest R. Goodson, Campbell; William H. Shipman, La Mesa, and Joseph F. McCartney, Solana Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1978, Ser. No. 871,562

Int. Cl.² H01M *6/00*

U.S. Cl. 429—105 **6 Claims**



1. In a battery, the improvement comprising:
a lithium anode;
an electrolyte of tetra-butylammonium bromide;
a catholyte of liquid bromine; and
the electrolyte being dissolved in the liquid bromine.

4,145,485

METHOD FOR SEALING BATTERY

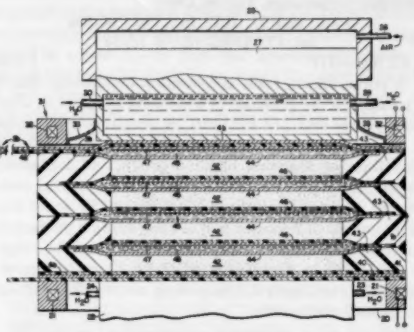
Gordon F. Kinsman, Billerica, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 761,650, Jan. 24, 1977, Pat. No. 4,069,578. This application Jun. 27, 1977, Ser. No. 809,975

Int. Cl.² H01M *6/46*

U.S. Cl. 429—152 **2 Claims**

1. A thin, flat laminar battery comprising cells including active components comprising laminar anodes and cathodes separated by laminar separators, said cells being chemically isolated and electrically connected in series by intermediate laminar intercell connectors, insulating frames having central openings receiving said anodes and cathodes and being bonded together to form a peripheral seal surrounding said active components, and terminal laminae comprising opposed thin metal terminal sheets bonded to thermoplastic liquid impervious conductive current collectors, said current collectors being in contact with electrodes of opposite polarity on either side of said battery and being bonded to said frames at their peripheries to complete a seal about said active components without deformation of said metal terminal sheets; in which the combined thicknesses of said frames are substantially equal to



the combined thicknesses of said anodes, said cathodes, said separators and said intercell connectors.

4,145,486

INSOLUBLE WEAK BASE EXCHANGE RESIN-METAL COMPOUND COMPLEX

Werner O. Haag, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 501,429, Aug. 29, 1974, Pat. No. 4,111,856, which is a continuation of Ser. No. 306,782, Nov. 15, 1972, which is a continuation-in-part of Ser. No. 860,807, Sep. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 672,010, Oct. 2, 1967, abandoned. This application Dec. 7, 1977, Ser. No. 858,228

Int. Cl.² C08F *4/00*; B01J *31/06*

U.S. Cl. 521—31 **3 Claims**

1. As insoluble resin-metal coordinative complex compound comprising an insoluble weak base exchange resin having amine, phosphine, arsine, stibine, thiol or sulfide Lewis base substituents, coordinatively, non-ionically bonded through said substituents to a metal atom selected from the group consisting of platinum, palladium, rhodium, ruthenium, osmium, iridium, gold, cadmium, titanium, zirconium, hafnium, vanadium, chromium, molybdenum, tungsten, manganese, rhenium, iron, cobalt, nickel, copper, zinc, silver and mercury, said metal atom having chemically bonded thereto at least one ligand and said complex containing on a weight basis 0.01 to 50% of metal, 39 to 99% of resin with the sum of the amount of the ligand and metal not exceeding 61%.

4,145,487

POLYURETHANE FOAMS CONTAINING REACTIVE FIBERS AND PROCESS FOR THEIR MANUFACTURE

Klaus J. Behme, Hofheim; Harald Cherdron, Naurod; Wolfgang Gordon, Hofheim, and Hugo Burkhardt, Dreieichenhain, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 13, 1976, Ser. No. 676,614

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606562

Int. Cl.² C08G *18/14*

U.S. Cl. 521—117 **4 Claims**

1. Fiber containing poly-urethane foams, which contain from 0.1 to 10% by weight, relative to the finished foam, of polyolefin fibers having polyfunctional reactive components for isocyanates fixed to the surface or fixed to the core of said fibers, said components being compounds having at least two OH groups.

4,145,488

FIRE RETARDANT POLYURETHANE FOAMS

David E. Hayden, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 12, 1977, Ser. No. 796,106
Int. Cl.[2] C08G 18/14, 18/48
U.S. Cl. 521—177 7 Claims

1. A polyurethane foam composition comprising the reaction product in the presence of a blowing agent of an organic polyisocyanate and, per 100 parts by weight of said composition, about 5 to 10 parts by weight of a first polyol comprising an oxyalkylated Mannich reaction product of a phenol, an aldehyde, and an alkanol amine reacted to a hydroxyl number within the range of from about 350 to about 650, about 8 to 13 parts by weight of a second polyol comprising a pentaerythritol oxyalkylated to a hydroxyl number within the range of from about 350 to about 650 and about 12 to 17.5 parts by weight of a third polyol comprising an oxyalkylated tetrabromophthalic anhydride.

4,145,489

HIGH NITRILE POLYMER COMPOSITIONS CONTAINING GLUTARALDEHYDE

Mary E. Wozny, Coolville, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 22, 1977, Ser. No. 818,185
Int. Cl.[2] C08K 5/07
U.S. Cl. 526—1 3 Claims

1. An essentially solvent-free resin composition consisting of one hundred parts by weight of a high nitrile polymer and from 0.05 to 0.50 parts by weight of glutaraldehyde, said high nitrile polymer containing greater than 50% by weight nitrile monomer based on total polymer weight.

4,145,490

CARBOXYLATED COPOLYMERS OF ISOBUTYLENE AND A VINYLBENZENE

John F. Harris, Jr., and William H. Sharkey, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 616,839, Sep. 25, 1975, which is a continuation-in-part of Ser. No. 508,886, Sep. 24, 1974, abandoned. This application Apr. 1, 1977, Ser. No. 783,730
Int. Cl.[2] C08F 8/00, 8/06
U.S. Cl. 526—19 8 Claims

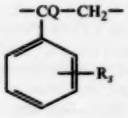
1. A carboxylated copolymer of the formula

$$X_mY_nY'_p$$

wherein

X is an isobutylene monomer unit,

Y is a non-carboxylated vinylbenzene monomer unit of the formula



in which

Q is hydrogen or lower alkyl,

R is halogen, lower alkyl, chloro lower alkyl, lower alkoxy, or two adjacent R's together are methylenedioxy, and

s is an integer from 0 to 5,

Y' is a carboxylated Y unit,

m represents the number of isobutylene monomer units in the copolymer,

n represents the number of non-carboxylated vinylbenzene monomer units in the copolymer,

p represents the number of carboxylated vinylbenzene monomer units in the copolymer and is 5 to 100% of (n + p), m and (n + p) are in an m:(n + p) ratio of 2:1 to 1000:1,

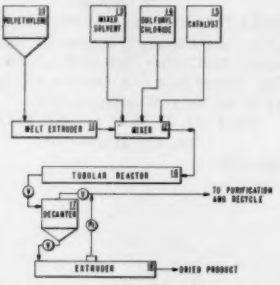
X, Y and Y' are randomly interconnected through carbon to carbon linkages with single Y and Y' units predominately connected only to X units, and the copolymer has an equivalent weight per carboxyl group of 200 to 1×10^5.

4,145,491

CHLORINATION OR CHLOROSULFONATION OF POLYETHYLENE IN MIXED SOLVENT

Donald J. Ryan, Beaumont, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 9, 1977, Ser. No. 805,151
Int. Cl.[2] C08F 8/38, 8/36
U.S. Cl. 526—31 10 Claims



1. In a continuous process for chlorinating or chlorosulfonating polyethylene which comprises dissolving polyethylene in a solvent and reacting the resultant solution with sulfuryl chloride at a temperature and under sufficient pressure to maintain reactants, the resulting chlorinated or chlorosulfonated polyethylene and product gases in a single liquid phase, the improvement comprising using as the solvent a mixture of methylene chloride and trichlorofluoromethane in a weight ratio of 0.3–1.6, and reducing the pressure on the single liquid phase about 3–15 MPa below the reactor pressure or increasing the temperature on the single liquid phase at least about 10°–20° C. above the reactor temperature to form two liquid phases, one a polymer-rich phase and the other a solvent-rich phase, and separating the phases.

4,145,492

CATALYTIC DEHYDROHALOGENATION PROCESS FOR ALLYLICALLY HALOGENATED UNSATURATED HYDROCARBON POLYMERS

Irwin J. Gardner, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 7, 1977, Ser. No. 775,389
Int. Cl.[2] C08F 8/26
U.S. Cl. 526—47.3 20 Claims

1. A method for dehydrohalogenating an allylically halogented unsaturated hydrocarbon polymer which comprises contacting said polymer in the liquid phase at a temperature of about 50° to 250° C. in the presence of a dehydrochlorination catalyst selected from the group consisting of activated alumina supported CuO, Cu_2O, and $CuCl_2$, catalyst composition or a dehydrobromination catalyst selected from the group consisting of activated alumina supported CuO, Cu_2O and $CuCl_2$ catalyst compositions.

4,145,493

OXIDATION OF RUBBERY POLYMERIC HYDROCARBONS

Dennis G. Petrille, Naperville, and George S. Culbertson, Downers Grove, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 1, 1977, Ser. No. 856,357
Int. Cl.[2] C08F 8/06
U.S. Cl. 526—58 2 Claims

1. A method of oxidative molecular weight degradating an ethylene-propylene copolymer of average number molecular weight in the range of from 10,000 up to 40,000 and introducing into the resulting lower molecular weight molecule entities a plurality of keto-carbonyl groups which comprises heating a solution of from 5 up to 13 weight percent of said copolymer in an oleaginous solvent to a temperature in the range of from 160° C. up to 215° C., adding to said heated solution a gas containing molecular oxygen in the aspirating or suction side of a means for spraying fluids, spraying such mixture into a chamber maintained at a temperature of from 160° C. up to 215° C. to disengage oxygen depleted gas from the resulting solution and recovering the gas-free solution.

4,145,494

AQUEOUS FREE RADICAL EMULSION POLYMERIZATION

Terry C. Neubert, Ravenna, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed May 10, 1978, Ser. No. 904,643
Int. Cl.[2] C08F 2/22, 4/00
U.S. Cl. 526—81 2 Claims

1. In the method of aqueous emulsion free radical polymerization of at least one conjugated diene monomer having from 4 to 6 carbon atoms or a mixture of a major amount by weight of at least one conjugated diene monomer having from 4 to 6 carbon atoms and a minor amount by weight of at least one copolymerizable vinyl monomer having not over 14 carbon atoms using an alkyl or aralkyl mercaptan chain transfer agent having from 8 to 18 carbon atoms, the improvement which comprises at at least 75% conversion of total monomer(s) to polymer adding an additional amount of said agent to the polymerization system in an amount of at least 1½ times by weight of the amount by weight of said agent added to the system prior to said 75% conversion of total monomer(s) to polymer(s) and stopping the polymerization in the range of from about 90 to 99+% conversion to obtain a processable polymer with a reduced amount of gel, the total amount of said agent used during the polymerization being from about 0.75 to 2.5 parts by weight per 100 total parts by weight of said monomer(s).

4,145,495

AQUEOUS FREE-RADICAL POLYMERIZATION USING REDOX SYSTEM INITIATOR THAT AVOIDS ADVERSE EFFECTS OF POLYMERIZATION INHIBITING CATIONS

Peter M. Robinson, Thorton; Michael W. C. Coville, Oakwood Park, and Robin W. Dexter, Ilkley, all of England, assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 877,146, Feb. 13, 1978, abandoned. This application May 24, 1978, Ser. No. 909,320
Int. Cl.[2] C08F 2/16, 4/40, 220/22
U.S. Cl. 526—93 5 Claims

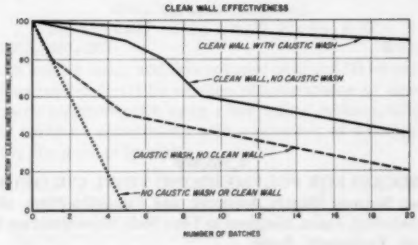
1. In a process for preparing a water-soluble polymer from an ethylenically unsaturated monomer by free-radical polymerization in an aqueous polymerization medium in the presence of a redox system comprising an oxidizing agent and a chelatable metal reducing agent having a reduced and oxidized form and also in the presence of an impurity chelatable cation species inhibiting said polymerization, the improvements which comprise (1) adding to said polymerization medium a chelating agent which complexes said impurity chelatable cation species at a rate faster than the reduced form of said chelatable reducing agent, the amount of said chelating agent added being effective in overcoming inhibiting effects of said impurity chelatable cation species, and (2) also adding to said polymerization medium a chelatable cation species inert to said polymerization, said inert chelatable cation species being complexed at a rate slower than said impurity chelatable cation species but at a rate equal to or faster than said reduced form of said chelatable metal reducing agent, the amount of said inert chelatable cation species being in excess of the total complexing capacity of said chelating agent.

4,145,496

PREVENTION OF PVC POLYMER BUILDUP IN POLYMERIZATION REACTORS USING OXALYL BIS(BENZYLIDENEHYDRAZIDE) AND ALUMINA

Dean R. Weimer, Ponca City, and Kenneth D. Freshour, Oklahoma City, both of Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jul. 3, 1978, Ser. No. 921,647
Int. Cl.[2] C08F 2/18
U.S. Cl. 526—62 9 Claims



1. A method for preventing polymer fouling of reactor surfaces in contact with the polymerization medium during the polymerization of vinyl chloride monomer to produce PVC comprising the steps of

(1) contacting the affected reactor surfaces with a water dispersion of oxalyl bis(benzylidenehydrazide) and alumina prior to

(2) charging the reactor and carrying out the reaction.

4,145,497

URANIUM-CONTAINING MIXED CATALYSTS AND THEIR USE FOR THE POLYMERIZATION OF OLEFINS

Gerd Sylvester, Leverkusen; Josef Witte, Cologne, and Gunter Marwede, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 31, 1977, Ser. No. 801,465
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625390
Int. Cl.[2] C08F 4/62, 36/06
U.S. Cl. 526—164 9 Claims

1. A uranium-containing organometallic mixed catalyst system comprising the reaction product of (a) and (b) mixed with (c), wherein (a) is a uranium salt of a carboxylic acid with uranium having the formal oxidation state +4 and the carboxylic acid having at least 3 carbon atoms, (b) is a Lewis acid and (c) is an aluminum trialkyl and/or dialkyl aluminum hydride.

4,145,498

ADDITION OF COUPLING AGENT DURING ORGANOLITHIUM INITIATED POLYMERIZATIONS

Ralph C. Farrar, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 447,203, Mar. 1, 1974, Pat. No. 4,020,258, which is a continuation of Ser. No. 195,810, Nov. 4, 1971, abandoned. This application Jan. 26, 1977, Ser. No. 762,691
The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.
Int. Cl.[2] C08F *4/08, 4/16, 36/06, 36/08*
U.S. Cl. 526—178 **26 Claims**

1. In a process for the polymerization of at least one polymerizable monomer comprising a polymerizable conjugated diene, polymerizable monovinyl-substituted aromatic compound, or both, under polymerization conditions with an organolithium initiator, the improvement which comprises initiating the polymerization reaction with said organolithium initiator and adding said organolithium initiator in a continuous manner, further adding at least one nonpolymerizable silicon or tin coupling agent in a continuous manner commencing from a degree of conversion of about 3 percent up to about 75 percent, such that each of said organolithium initiator and said nonpolymerizable coupling agent is added essentially continuously simultaneously during at least a portion of the course of said polymerization.

4,145,499

PROCESS FOR POLYMERIZING VINYL CHLORIDE

Mineo Nagano; Shigeru Awazawa, and Tatsuhiko Niwa, all of Yokkaichi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Apr. 28, 1978, Ser. No. 901,243
Claims priority, application Japan, May 6, 1977, 52-51253; Jul. 26, 1977, 52-88863
Int. Cl.[2] C08F *2/02, 6/26, 14/06*
U.S. Cl. 526—201 **12 Claims**

1. In a process for polymerizing a monomer selected from the group consisting of vinyl chloride and combinations of at least about 90% by weight of vinyl chloride with not more than about 10% by weight of at least one copolymerizable monoethylenically unsaturated monomer, in the vapor phase, maintained at a pressure lower than the vapor pressure of the monomer at the polymerization temperature employed, and in the presence of seed vinyl chloride polymer particles, the seed vinyl chloride polymer being a homopolymer or a copolymer comprised of at least about 90% by weight of units derived from vinyl chloride and not more than about 10% by weight of units derived from at least one copolymerizable monoethylenically unsaturated monomer, the improvement which comprises:

using, as the seed vinyl chloride polymer particles, a vinyl chloride polymer prepared by bulk polymerization conducted in the presence of 0.001% to 2% by weight based on the weight of the monomer, of a cellulose ether soluble in the monomer.

8. A process for polymerizing a monomer selected from the group consisting of vinyl chloride and combinations of at least about 90% by weight of vinyl chloride with not more than about 10% by weight of at least one copolymerizable monoethylenically unsaturated monomer, which comprises polymerizing the monomer under bulk conditions in the presence of 0..001% to 2% by weight, based on the weight of the monomer, of a cellulose ether soluble in the monomer.

4,145,500

STABILIZATION OF CROSSLINKABLE POLYMERS

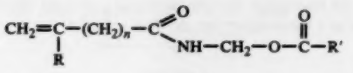
Theo Neukam, Dormagen; Frank Druschke, Stuttgart; Francis Bentz, Cologne, and Günther Nischk, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,162
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633766
Int. Cl.[2] C08F *220/48*
U.S. Cl. 526—204 **1 Claim**

1. In a process for the preparation of a stabilized copolymer of acrylonitrile by copolymerizing in an aqueous medium in the presence of a redox catalyst at a pH of 2 to 4.2 a mixture containing

a. at least 65% by weight acrylonitrile

b. 0.1 to 3% by weight of an N-methylol acylester of the formula



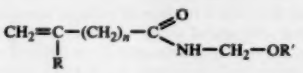
wherein

R is hydrogen or methyl;

R′ is a linear or branched aliphatic radical of 1–10 carbon atoms; and

n is 0 or an integer from 1–5; and

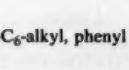
c. 0 or 0.5–5% by weight of an N-methylol alkylether of the formula



wherein

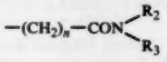
R, R′, and n have the same meaning as given above; the improvement which comprises carrying out the copolymerization in the presence of 2 to 12% by weight, based on the total quantity of comonomers, of at least one water-soluble compound of the following types:

1. a carboxylic acid amide of the formula



wherein

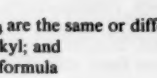
R_1 is hydrogen, C_1–C_6-alkyl, phenyl or



where n is 1–3; and

R_2 and R_3 are the same or different and are hydrogen or C_1–C_6-alkyl;

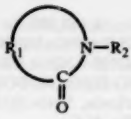
2. urea of the formula



wherein

R_1, R_2, R_3, and R_4 are the same or different and are hydrogen or C_1–C_3-alkyl; and

3. a lactam of the formula



wherein
R_1 is C_3–C_6-alkylene and
R_2 is C_1–C_3-alkyl.

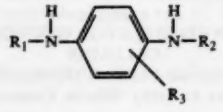
4,145,501

WATER-SOLUBLE COATING COMPOSITION

Atsushi Kaiya, Kawasaki; Yutaka Otsuki, and Hideo Horii, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 518,824, Oct. 29, 1974, abandoned. This application Nov. 16, 1977, Ser. No. 851,905
Claims priority, application Japan, Nov. 1, 1973, 48/123042
Int. Cl.[2] C08K *5/16*
U.S. Cl. 526—217 **14 Claims**

1. A water-soluble coating composition comprising an adduct (1) of a butadiene lower polymer or lower copolymer (A) and α, β-ethylenically unsaturated dicarboxylic acid compound (B) resulting from the reaction of said (A) and (B) in the presence of one or more (C) p-phenylenediamine derivatives



in which R_1 and R_2 are the same or different saturated hydrocarbon groups each having 1 to 20 carbon atoms, or monocyclic and polycyclic aromatic hydrocarbon groups, and R_3 is a hydrogen atom or a saturated hydrocarbon group having 1 to 20 carbon atoms; a hydrophilic solvent (2); and a neutralizer (3), said one or more (C) p-phenylenediamine derivatives selected from the group consisting of N,N′-dimethyl-p-phenylenediamine, N,N′-diethyl-p-phenylenediamine, N,N′-dipropyl-p-phenylenediamine, N,N′-diisopropyl-p-phenylenediamine, N,N′-di-n-butyl-p-phenylenediamine, N,N′-di-sec-butyl-p-phenylenediamine, N,N′-di-tert-butyl-p-phenylenediamine, N,N′-diphenyl-p-phenylenediamine, N-phenyl-N′-isopropyl-p-phenylenediamine, N,N′-di-β-naphthyl-p-phenylenediamine, and mixtures thereof.

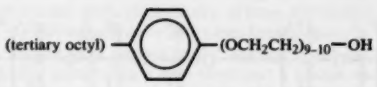
4,145,502

SPHEROIDAL PARTICULATE POLYTETRAFLUOROETHYLENE DISPERSION RESIN

Max B. Mueller, Morristown; Peter P. Salatiello, Morris Plaines, and Dulari L. Sawhney, Highland Park, all of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Division of Ser. No. 328,226, Jan. 31, 1973, Pat. No. 4,038,230, which is a division of Ser. No. 91,046, Nov. 19, 1970, Pat. No. 3,752,796. This application May 6, 1977, Ser. No. 794,683
Int. Cl.[2] C08F *14/26*
U.S. Cl. 526—255 **1 Claim**

1. Particulate polytetrafluoroethylene resin having a surface area of at least 9 sq.m./g., predominantly comprising spheroidal particles having an average particle diameter of greater than 0.35 micron, a narrow particle size distribution corresponding to a distribution function of less than 0.4, and a number average molecular weight of at least 2.0×10^6 which is characterized by its capacity for forming concentrated aqueous dispersions containing at least 75 percent by weight of polytetrafluoroethylene produced by the method which involves adding to an aqueous latex consisting of at least about 15 percent by weight of said particulate polytetrafluoroethylene a polyethylene glycol-p-octyl phenol ether having the formula



in amount of 2 percent by weight, based on the weight of the water, adjusting the pH of the latex to about 5 by adding aqueous ammonium, dispersing a 1 percent aqueous solution of ammonium alginate in the latex in amount sufficient to incorporate therein 0.1 percent of ammonium alginate, based on the combined weight of the water, allowing the latex to stand for 16 hours to cause it to separate into a concentrated latex phase and a supernatant clear aqueous phase, and separating the phases so formed to recover a concentrated polytetrafluoroethylene dispersion containing at least 75 percent by weight of polytetrafluoroethylene.

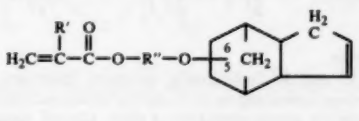
4,145,503

AUTOXIDIZABLE COMPOSITIONS

William D. Emmons, Huntingdon Valley, and Kayson Nyi, Sellersville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 28, 1977, Ser. No. 782,129
The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.
Int. Cl.[2] C08F *36/00, 136/00, 236/00, 4/32*
U.S. Cl. 526—282 **9 Claims**

1. A soluble linear addition polymer obtained (1) by anionic polymerization or (2) by solution polymerization or aqueous emulsion polymerization using a free radical initiator, adapted to be cured by autoxidation with a siccative, of a compound having the general formula:



(I)

wherein
R′ is H or CH_3 and
R″ is selected from the groups consisting of
(a) Alkylene groups having 2 to 6 carbon atoms and
(b) Oxaalkylene groups having 4 to 12 carbon atoms and having one or more oxygen atoms joining distinct segments of the alkylene chain each of at least 2 carbon atoms length extending between oxygen atoms of the alkylene group.

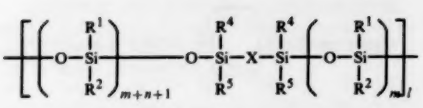
4,145,504

HIGH TEMPERATURE CARBORANE-SILOXANE ELASTOMERS INTERMEDIATE POLYMERIC PRODUCTS AND PROCESS FOR PREPARATION

Eddie Hedaya, White Plains, N.Y.; James H. Kawakami, Piscataway, and George T. Kwiatkowski, Greenbrook, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

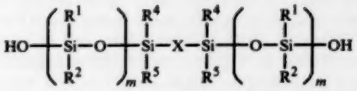
Continuation-in-part of Ser. No. 588,850, Jun. 20, 1975, abandoned, which is a continuation of Ser. No. 500,473, Aug. 26, 1974, abandoned, which is a continuation of Ser. No. 382,278, Jul. 24, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,509
Int. Cl.[2] C08G *77/04*
U.S. Cl. 528—5 **18 Claims**

1. A process for the preparation of a carborane-siloxane composition comprised of at least one essentially liner carborane-siloxane polymer having the following formula:



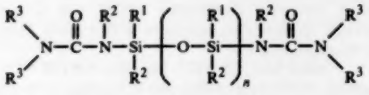
which process comprises the steps of:

(a) contacting under an inert atmosphere a carborane disilanol of the formula:



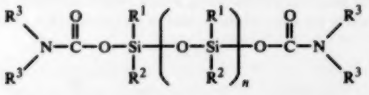
with a silicone compound selected from the group consisting of:

(i) ureido-silanes or , ω-ureido-siloxanes of the formula:



pr

(ii) silyl carbamates or α, ω-carbamoyl-siloxanes of the formula:



wherein:

(1) R^1 and R^2 individually represent hydrogen, or groups containing up to 14 carbon atoms and selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl, alkaryl, aralkyl, alkoxy, alkoxyaryl, cyanoalkyl, morpholinyl, and pyridinyl;

(2) R^3 individually represents hydrogen or a group containing up to 14 carbon atoms and selected from the group consisting of alkyl, alkenyl, cycloalkyl, alkaryl, aralkyl, alkoxyaryl, haloaryl, cyanoalkyl, morpholinyl and pyridinyl; and wherein 2 R^3s, can when taken together contain up to 6 carbon atoms and represent alkylene, dialkylene amine or alkyl-substituted dialkylene amine;

(3) R^4 and R^5 individually represent hydrogen or groups containing up to 14 carbon atoms and selected from the group consisting of alkyl, alkenyl, aryl, alkaryl, alkoxy and alkoxyalkyl,

(4) X represents a divalent radical derived from 1,7-decacarborane, 1,12 -decacarborane, 1,10-octacarborane, 1,6-octacarborane, 2,4-pentacarborane, 1,6-tatracarborane, 9-alkyl-1,7-decacarborane, 9,10-dialkyl-1,7-decacarborane, 2-alkyl-1,12-decacarborane, 2-alkyl-1,10-octacarborane, 8-alkyl-1,6-octacarborane, decachloro-1,7decacarbornae, decachloro-1,12-decacarborane, octachloro-1,10-octacarborane, decafluoro-1,7-decacarborane, decafluoro-1,12- decacarborane, octafluoro-1,10-octacarborane, or mixtures thereof,

(5) m and N individually have a value of from 0 to 4 and l has a value such that the molecular weight of the polymer is up to about 150,000 and higher; and

(b) recovering said carborane-siloxane polymer.

4,145,505

CROSS-LINKABLE ORGANOPOLYSILOXANE COMPOSITIONS AND A PROCESS FOR CROSS-LINKING ORGANOPOLYSILOXANES

Willem C. Endstra, Bathmen, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 9, 1978, Ser. No. 867,636

Claims priority, application Netherlands, May 13, 1977, 7705360

Int. Cl.[2] C08G 77/04

U.S. Cl. 528—10 **7 Claims**

1. A thermally cross-linkable composition consisting essentially of

(1) An organopolysiloxane having structural units defined by the formula RR_1SiO, wherein R is an alkyl group having from 1 to about 4 carbon atoms and R_1 is selected from the group consisting of alkyl having from 1 to about 4 carbon atoms, aryl having 6 carbon atoms, aralkyl having from about 7 to about 9 carbon atoms, cycloalkyl having from about 6 to about 9 carbon atoms, alkenyl having from 2 to about 4 carbon atoms, and cycloalkenyl having 6 carbon atoms; and

(2) bis(o-chlorobenzoyl)peroxide which is present in an effective amount so that at least partial cross-linking of the organopolysiloxane occurs at a temperature below the decomposition temperature of said organopolysiloxane.

4,145,506

PACKING MATERIALS FOR GAS SEPARATION COLUMNS

Yokichi Yamamoto, and Yoshinari Ohwaku, both of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Nov. 4, 1977, Ser. No. 848,532

Claims priority, application Japan, Dec. 29, 1976, 51-158248

Int. Cl.[2] C08G 77/04

U.S. Cl. 528—10 **1 Claim**

1. A gas chromatography column containing a packing material which consists essentially of particulate $RSiO_{3/2}$ resin or particulate resins consisting of $RSiO_{3/2}$ and minor amounts of other siloxane units selected from R_2SiO, $R_3SiO_{1/2}$ and $SiO_{4/2}$ or mixtures thereof wherein R is an alkyl group, aryl group, alkenyl group or mixtures thereof, wherein the particle size of the packing material has a mean particle size of from 50–150 mesh as measured by the Tyler Standard Mesh.

4,145,507

REACTION MIXTURES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS POLYMERIZATION INITIATORS

Heinrich Wolfers, Rheurdt; Hans Rudolph, and Hans J. Rosenkranz, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

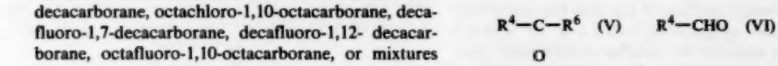
Filed Jul. 13, 1977, Ser. No. 815,159

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632294; Dec. 15, 1976, 2656782

Int. Cl.[2] C08G 77/04

U.S. Cl. 528—25 **3 Claims**

1. A process for the preparation of a reaction mixture suitable as an initiator for free radical-initiated polymerisation reactions, which comprises reacting 1 mol of an α-arylketone or of an arylaldehyde of the general formula V or VI respectively



wherein R^4 represents an aryl radical optionally substituted by C_1–C_4 alkyl, methoxy, chlorine or fluorine, and R_6 represents an aryl radical optionally substituted by C_1–C_4 alkyl, methoxy, chlorine or fluorine, or a C_1–C_6-alkyl radical optionally substi-

tuted by C_1–C_4 alkyl, methoxy, chlorine or fluorine, or a C_5–C_7-cycloalkyl radical or hydrogen, and approximately the equivalent amount of a base metal in an inert aprotic solvent at −10 to +70° C. with 0.4 to 0.8 mol of a dichloro-organosilane of the general formula VII

$$R^1R^2SiCl_2 \quad \text{(VII)}$$

or with 0.25 to 0.6 mol of a trichloro-organosilane of the general formula VIII

$$R^1SiCl_3 \quad \text{(VIII)}$$

wherein R^1 represents a methyl, ethyl, phenyl, benzyl or chloromethyl radical, and R^2 represents a chlorine atom, a hydroxyl, methoxy, or ethoxy radical, or one of the substituents R^1 or with 0.1 to 0.7 mol of tetrachlorosilane, chlorinated polyorganosilanes or -siloxanes having a molecular weight of 150 to 3.000 until the exothermic reaction has ended, hydrolysing the reaction product, separating off the organic phase and stripping off the solvent under a pressure of between 2 and 6 mm Hg.

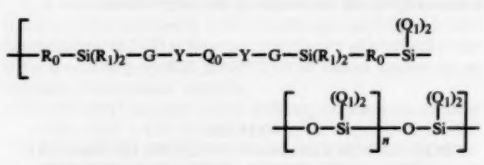
4,145,508

POLYSILOXANE THERMOPLASTIC ELASTOMERS

Michel Bargain, Lyons, and Marcel Lefort, Caluire, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 20, 1977, Ser. No. 817,342
Claims priority, application France, Aug. 17, 1976, 76 25533
Int. Cl.² C08G *77/06, 77/12, 77/26*
U.S. Cl. 528—31 **10 Claims**

1. Polysiloxane thermoplastic elastomers having the general formula:



wherein R_o which may be the same or different represents a divalent hydrocarbon radical containing from 2 to 10 carbon atoms; R_1 and Q_1 which may be the same or different represent monovalent hydrocarbon radicals selected from the group consisting of linear or branched alkyl radicals containing up to 10 carbon atoms, cycloalkyl radicals having 3 to 6 carbon atoms in the ring, aryl radicals, cyano groups and halogen atoms; G which may be the same or different represents an aromatic carbocyclic or heterocyclic radical; Q_o represents a divalent radical selected from the group consisting of aliphatic radicals containing up to 13 carbon atoms, cycloaliphatic radicals having 5 to 6 carbon atoms in the ring, heterocyclic radicals and aromatic radicals containing at least one benzene nucleus; Y which may be the same or different represents a group selected from the group consisting of —CONH— and —COO—; and, n is a number ranging from 0 to 2,000.

4,145,509

POLYACRYLATED POLYURETHANES AND GASKETS HAVING SEALANTS THEREOF

Yog R. Bhatia, Glen Ellyn, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Apr. 21, 1978, Ser. No. 898,921
Int. Cl.² C08G *18/16, 18/62;* F16J *15/14;* B65D *53/06*
U.S. Cl. 528—50 **19 Claims**

1. As a composition of matter, the reaction product of (a) a monoacrylated terminated, active hydrogen-containing hydrocarboxy reactant, (b) an aromatic diisocyanate, and (c) a polyacrylated terminated hydrocarboxy reactant, the active hydrogen of reactant (a) reacting with at least one isocyanate radical of reactant (b) to form an isocyanate linkage, the reaction product of reactants (a) and (b) being reacted with reactant (c) in a molar ratio, respectively, of from 1:25 to 25:1, said reactant (c) serving primarily as a cross-linking agent to bond together linear chains formed by the reaction of (a) and (b).

8. A gasket comprising a base sheet and a sealant thereon comprising the reaction product of (a) a monoacrylated terminated, active hydrogen-containing hydrocarboxy reactant, (b) an aromatic diisocyanate, and (c) a polyacrylated terminated hydrocarboxy reactant, the active hydrogen of reactant (a) reacting with at least one diisocyanate radical of reactant (b) to form an isocyanate linkage, the reaction product of reactants (a) and (b) being reacted with reactant (c) in a molar ratio, respectively, of from 1:25 to 25:1, said gasket having a compressibility at 1,000 psi of about 2% to about 20%, a film hardness by pencil test of 6B to 4H, an elongation of about 2% to about 100%, and a flexibility by mandrel test of from ⅛ inch to one inch without failure.

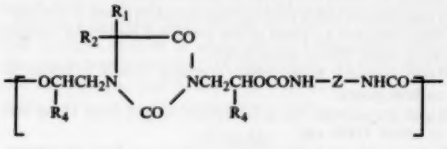
4,145,510

5-SUBSTITUTED PHOSPHONATE HYDANTOINS AND DERIVATIVES THEREOF

Luther A. R. Hall, Woodcliff Lake, N.J., and David A. Gordon, Scarsdale, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

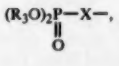
Division of Ser. No. 698,623, Jun. 21, 1976, Pat. No. 4,093,809. This application Mar. 9, 1978, Ser. No. 885,059
Int. Cl.² C08G *18/38*
U.S. Cl. 528—72 **4 Claims**

1. A flame resistant polyurethane having the unit structural formula V

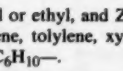


V

wherein R_1 is hydrogen or alkyl of 1 to 8 carbon atoms, R_2 is



R_3 is alkyl of 1 to 8 carbon atoms, X is a straight or branched chain alkylene of 1 to 4 carbon atoms or a straight or branched chain alkylene of 3 to 6 carbon atoms containing an internal carbamido group, or R_1 and R_2 together are Y where Y is a straight or branched chain alkylene of 4 to 8 carbon atoms having a pendant



R_4 is hydrogen, methyl or ethyl, and Z is alkylene of 4 to 10 carbon atoms, phenylene, tolylene, xylylene $—C_6H_4CH_2C_6H_4—$ or $—C_6H_{10}CH_2C_6H_{10}—$.

4,145,511

HYDROXYL-CONTAINING LIQUID POLYMERS AND PRESSURE-SENSITIVE ADHESIVES AND LAMINATES PREPARED THEREFROM

Jack C. Gilles, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 1, 1977, Ser. No. 829,699
Int. Cl.² B32B *27/40;* C08G *18/62, 18/63*
U.S. Cl. 528—73 **35 Claims**

1. A composition comprising (A) at least one alkyl acrylate

liquid polymer containing polymerized therein from about 1 weight percent to about 20 weight percent N-vinyl-2-pyrrolidone and containing both terminal and random hydroxyl functionality, and (B) at least one prepolymer of a polyalkylene ether glycol or polyester glycol with an excess amount of an aromatic diisocyanate, wherein

(1) said alkyl acrylate liquid polymer contains an average from about 1.4 to about 6 hydroxyl groups per molecule, and contains polymerized therein at least about 65 weight percent of at least one alkyl acrylate, the alkyl group of which contains from 3 to 10 carbon atoms,

(2) said polyalkylene ether glycol contains from 3 to 6 carbon atoms per alkylene group and has a molecular weight from about 400 to about 2,000,

(3) said aromatic diisocyanate contains from 8 to about 24 carbon atoms,

(4) said prepolymer has a molecular weight from about 900 to about 3,000, and

(5) the ratio of hydroxyl equivalents to free isocyanate equivalents is from about 0.7/1 to about 4.5/1.

16. A laminate structure having as adhesive a composition comprising (A) at least one alkyl acrylate liquid polymer containing polymerized therein from about 1 weight percent to about 20 weight percent N-vinyl-2-pyrrolidone and containing both terminal and random hydroxyl functionality, and (B) at least one prepolymer of a polyalkylene ether glycol or polyester glycol with an excess amount of an aromatic diisocyanate, wherein

(1) said alkyl acrylate liquid polymer contains an average from about 1.4 to about 6 hydroxyl groups per molecule, and contains polymerized therein at least about 65 weight percent of at least one alkyl acrylate, the alkyl group of which contains from 3 to 10 carbon atoms,

(2) said polyalkylene ether glycol contains from 3 to 6 carbon atoms per alkylene group and has a molecular weight from about 400 to about 2,000,

(3) said aromatic diisocyanate contains from 8 to about 24 carbon atoms,

(4) said prepolymer has a molecular weight from about 900 to about 3,000, and

(5) the ratio of hydroxyl equivalents to free isocyanate equivalents is from about 0.7/1 to about 4.5/1.

4,145,512
PERMANENTLY STABILIZED POLYURETHANES

Paul Uhrhan, Cologne; Harald Oertel, Odenthal; Reinhard Lantzsch, Cologne; Ernst Roos, Odenthal, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

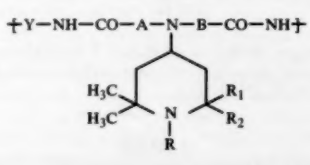
Filed Sep. 19, 1977, Ser. No. 834,765

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642386

Int. Cl.[2] C08G *18/65, 18/32;* **C07D** *211/06*

U.S. Cl. 528—73 **4 Claims**

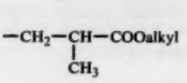
1. Permanently stabilized polyurethanes containing polymer segments represented by the following formula:



wherein

Y represents the group derived from a diisocyanate or from an diisocyanat prepolymer,

R represents hydrogen, a straight chain or branched chain alkyl group having 1 to 20 C atoms, an alkenyl group having 3 to 5 C atoms, an aralkyl group having 7 to 12 C atoms, the group $-CH_2-CHR_5-OH$ wherein R_6 denotes hydrogen, methyl or phenyl; the group $-CH_2-CH_2-CN$, the group $-CH_2-CH_2$-COOalkyl or the group

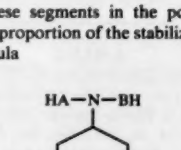


R_1 and R_2 may be identical or different and may each represent a straight chain or branched chain alkyl group having 1 to 6 C atoms or, together with the ring carbon atom to which they are attached, they may represent a cycloalkyl ring having 5 to 7 C atoms.

A may represent a direct bond, an ω-hydroxyalkyl, an ω-aminoalkyl, an ω-carboxylic acid hydrazido-, an ω-semicarbazido or an ω-carbazic ester group, in each case without the hydrogen atom in the end position.

B represents an ω-hydroxyalkyl-, an ω-aminoalkyl-, an ω-carboxylic acid hydrazido- or an ω-semicarbazido group, in each case without the hydrogen atom in the end position,

the quantity of these segments in the polyurethanes being selected so that the proportion of the stabilizers represented by the following formula



is from 0.05 to 5% by weight in the polyurethane.

4,145,513
PROCESS FOR THE MANUFACTURE OF SOLUBLE COPOLYMERS WHICH CONTAIN HYDROXYL GROUPS AND CAN BE CROSSLINKED WITH ORGANIC POLYISOCYANATES

Horst Dalibor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 20, 1977, Ser. No. 798,997

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626900

Int. Cl.[2] C08G *18/62*

U.S. Cl. 528—75 **13 Claims**

1. Process for the manufacture of coatings from copolymers containing hydroxyl groups, which copolymers are reaction products of mixtures of styrene, methyl methacrylate, hydroxyethyl methacrylate, acrylic acid and glycidyl esters of α-alkylalkanemonocarboxylic acids and/or α,α-dialkylalkanemonocarboxylic acids or products of a reaction of acrylic acid and a glycidyl ester followed by copolymerization with the remaining compounds of the aformentioned mixtures, and from an organic polyisocyanate in a solvent comprising no active hydrogen atoms, wherein a mixture consisting of

(A) a copolymer containing hydroxyl groups and consisting of

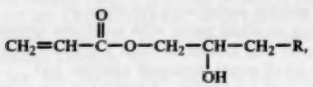
(a) 20–25.9% by weight of styrene,

(b) 20–24% by weight of methyl methacrylate,

(c) 18–24% by weight of hydroxyethyl methacrylate,

(d) 8.5–11% by weight of acrylic acid and

(e) 29.0–35.0% by weight of glycidyl ester of α-alkylalanemonocarboxylic acid and/or α,α-dialkylalkanemonocarboxylic acid having the empirical formula $C_{13}H_{24}O_3$ or wherein components d) and e) are incorporated as a prereacted product of the formula



wherein R is the radical of α-alkylalkanemonocarboxylic acid and/or α,α-dialkylalkanemonocarboxylic acid and the radical has the empirical formula $C_{10}H_{19}O_2$ in an amount of 37.5–46% by weight, and wherein the incorporated components (a), (b), (c), (d), and (e) have a total of 100% by weight, dissolved in a solvent containing no active hydrogen atoms, and

(B) an organic polyisocyanate, the amount of the copolymer (A) and the polyisocyanate (B) in the coating mixture adding up to 100 percent by weight, and this mixture is shaped or applied to suitable substrate and the solvent is then removed, in order to obtain the finished coating.

4,145,514
POLYURETHANE PRESSURE-SENSITIVE ADHESIVE AND LAMINATES THEREFROM

William E. deVry; Ralph S. Drake, both of Lakewood, and Richard T. Morrissey, Cuyahoga Falls, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 1, 1977, Ser. No. 829,691

Int. Cl.[2] B32B *27/40*; C08G *18/62, 18/63*

U.S. Cl. 528—75 **35 Claims**

1. A composition comprising (A) at least one alkyl acrylate liquid polymer containing both terminal and random hydroxyl functionality, and (B) at least one prepolymer of a polyalkylene ether glycol or polyester glycol with an excess amount of an aromatic diisocyanate, wherein

(1) said alkyl acrylate liquid polymer contains an average from about 1.4 to about 6 hydroxyl groups per molecule, and contains polymerized therein at least about 65 wt.% of at least one alkyl acrylate, the alkyl group of which contains from 3 to 10 carbon atoms,

(2) said polyalkylene ether glycol contains from 3 to 6 carbon atoms per alkylene group and has a molecular weight from about 400 to about 2,000,

(3) said aromatic diisocyanate contains from 8 to about 24 carbon atoms,

(4) said prepolymer has a molecular weight from about 900 to about 3,000, and

(5) the ratio of hydroxyl equivalents to free isocyanate equivalents is from about 0.7/1 to about 4.5/1.

16. A laminate structure having as adhesive a composition comprising (A) at least one alkyl acrylate liquid polymer containing both terminal and random hydroxyl functionality, and (B) at least one prepolymer of a polyalkylene ether glycol or polyester glycol with an excess amount of an aromatic diisocyanate, wherein

(1) said alkyl acrylate liquid polymer contains an average from about 1.4 to about 6 hydroxyl groups per molecule, and contains polymerized therein at least about 65 wt.% of at least one alkyl acrylate, the alkyl group of which contains from 3 to 10 carbon atoms,

(2) said polyalkylene ether glycol contains from 3 to 6 carbon atoms per alkylene group and has a molecular weight from about 400 to about 2,000,

(3) said aromatic diisocyanate contains from 8 to about 24 carbon atoms,

(4) said prepolymer has a molecular weight from about 900 to about 3,000, and

(5) the ratio of hydroxyl equivalents to free isocyanate equivalents is from about 0.7/1 to about 4.5/1.

4,145,515
METHOD OF FORMING STORAGE-STABLE POLYURETHANE PREPOLYMERS

Vincent F. Pogozelski, Newtown, Pa., and Robert P. Conger, Park Ridge, N.J., assignors to Congoleum Corporation, Milwaukee, Wis.

Filed Dec. 1, 1976, Ser. No. 746,448

Int. Cl.[2] C08G *18/10, 18/42, 18/48, 18/82*

U.S. Cl. 528—77 **11 Claims**

1. A method of forming a liquid, low viscosity, low molecular weight, cross-linkable, stable polyurethane prepolymer which possesses excellent shelf-life and storage-life and which comprises: reacting an aliphatic polyisocyanate with a polyhydroxy compound having a molecular weight of from about 62 to about 3000, selected from the group consisting of triols, mixtures of triols and diols, and mixtures of tetrols and diols, the NCO/OH ratio of said aliphatic polyisocyanate to said polyhydroxy compound being from about 0.7:1 to about 6:1, the reaction between said aliphatic polyisocyanate and said polyhydroxy compound taking place in the presence of a suitable inert, non-reactive organic solvent at a reaction temperature of from about 0° C. to about 70° C. for a reaction time of from about ½ hour to about 12 hours in the presence of from about 0.00005% by weight to about 0.8% by weight of a catalyst, based on the total weight of the reaction mixture; terminating said reaction short of completion at a precent completion of reaction of from about 30% to about 80% by lowering the temperature of the reaction mixture to a substantially non-active state, whereby there is formed a liquid, low viscosity, low molecular weight, cross-linkable stable polyurethane prepolymer containing from about 2% by weight to about 30% by weight of unreacted NCO and from about 0.05% by weight to about 10% by weight of unreacted OH in said reaction mixture and having excellent shelf-life and storage-life; and maintaining said reaction mixture at said lowered temperature after said reaction is terminated short of completion, whereby said reaction does not proceed to any material extent.

4,145,516
PHOTODEGRADABLE POLYURETHANE COMPOSITIONS

James E. Guillet, Don Mills, and Ervin Dan, Toronto, both of Canada, assignors to The Governing Council of the University of Toronto, Toronto, Canada

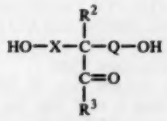
Division of Ser. No. 554,451, Mar. 3, 1975, Pat. No. 4,042,568, which is a division of Ser. No. 245,176, Apr. 18, 1972, Pat. No. 3,878,169, which is a continuation-in-part of Ser. No. 135,426, Apr. 18, 1971, abandoned. This application May 11, 1977, Ser. No. 795,800

Claims priority, application United Kingdom, Apr. 27, 1970, 20102/70; Jul. 15, 1970, 34238/70

Int. Cl.[2] C08G *28/42, 18/48*

U.S. Cl. 528—85 **4 Claims**

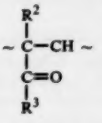
1. A condensation copolymer obtained by reacting together at least one glycol of general formula HO — R^4 — OH where R^4 is an organic radical selected from the group consisting of aliphatic, alicyclic, aromatic and araliphatic hydrocarbon radicals, or a polyether or polyester glycol or polyol, at least one diisocyanate of general formula OCN — R^5 — NCO where R^5 is a divalent hydrocarbon radical selected from the group consisting of aliphatic, alicyclic, aromatic and araliphatic, and a monomer of the formula C:



(C)

where X is selected from the group consisting of methylene chains having 0–6 carbon atoms, and methylene chains of 2–6 carbon atoms interrupted by ester linkages, Q is selected from

the group consisting of methylene chains having 1–6 carbon atoms, and methylene chains of 2–6 carbon atoms interrupted by ester linkages, R^2 is hydrogen or an alkyl group of 1–6 carbon atoms, R^3 is an alkyl, aryl, alkaryl or alkenyl group of from 1–12 carbon atoms, the monomer of formula C providing a unit of structure



in the backbone of the copolymer, the number of said units being sufficient to provide from about 0.01 weight % to about 3 weight % of ketone carbonyl based upon the total copolymer.

4,145,517

LINEAR COPOLYESTERS AS PACKAGES FOR COMESTIBLES

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 690,482, May 27, 1976. This application Nov. 2, 1977, Ser. No. 847,970

Int. Cl.[2] C08G *63/66*; B65D *85/72*

U.S. Cl. 528—173 **9 Claims**

1. A package comprising comestibles enveloped in a molded container formed from a linear copolyester which is the polymeric reaction product of reactants consisting essentially of

(A) isophthalic acid and 4,4'-sulfonyldibenzoic acid, and

(B) bis(4-beta-hydroxyethoxyphenyl) sulfone and ethylene,

wherein said copolyester has a O_2 permeability of less than about 7.4 cc.mil/100 in^2.day.atm., a CO_2 permeability of less than about 65.6 cc.mil/100 in^2.day.atm. and a glass transition temperature of at least about 121° C.

4,145,518

FIBERS, FILTER RODS AND OTHER NONWOVEN ARTICLES MADE FROM POLY(1,2-PROPYLENE TEREPHTHALATE)COPOLYESTERS OF TEREPHTHALIC ACID, 1,2-PROPYLENE GLYCOL AND ETHYLENE GLYCOL

Gerald P. Morie; Cephas H. Sloan; Winston J. Jackson, Jr., and Herbert F. Kuhfuss, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 6, 1976, Ser. No. 748,037

Int. Cl.[2] C08G *63/18*

U.S. Cl. 528—272 **5 Claims**

1. A fiber of a polyester of terephthalic acid or an ester forming derivative thereof and a glycol of from about 60 mole percent to 100 mole percent 1,2-propylene glycol and from 0 to about 40 mole percent ethylene glycol; said polyester having an inherent viscosity of at least about 0.35 in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. at a concentration of 0.5 gram of polyester in 100 ml. of said solvent, and a Tg of at least 80° C.

4,145,519

CATALYST FOR THE POLYMERIZATION OF 2-PYRROLIDONE FROM ALKALI METAL

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 607,844, Aug. 25, 1975, abandoned. This application May 6, 1977, Ser. No. 794,445

Int. Cl.[2] C08G *69/24*

U.S. Cl. 528—312 **7 Claims**

1. A process for polymerizing 2-pyrrolidone to a fiber-forming polypyrrolidone which comprises contacting said 2-pyrrolidone with a polymerization activator and a catalyst, prepared by a process comprising the steps of:

(a) reacting an alkali metal with an excess amount of a 5–7 membered-ring lactam to form a mixture of said lactam and an alkali metal lactamate catalyst; and

(b) allowing the evolution of hydrogen gas accompanying said reaction to subside and then distilling off about 5–50% by weight of the total lactam, from said mixture thereby yielding a residuum containing about 50–95% by weight of the total lactam.

4,145,520

PROCESS FOR THE CONTINUOUS POLYMERIZATION OF LACTAMS WITH STATIC MIXERS

Karlheinz Feltgen, Straberg; Hans J. Kaluza, Cologne; Edgar Muschelknautz, Leverkusen, and Hans J. Simon, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 620,312, Oct. 7, 1975, abandoned. This application Sep. 15, 1977, Ser. No. 833,642

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1974, 2448100

Int. Cl.[2] C08G *69/16*

U.S. Cl. 528—323 **8 Claims**

1. A process for continuous polymerization of caprolactam comprising heating caprolactam in a reactor under conditions sufficient to polymerize it to resinous polycaprolactam wherein said reactor comprises a reactor tube having a first end where caprolactam is fed and a second end where resinous polycaprolactam is removed, said reactor contains static mixing means in at least 30% of the first 60% of the reactor volume and said first 60% of reactor volume is measured from said first end.

4,145,521

METHOD OF DISCHARGING AND METERING SOLIDS IN LIQUIDS

Werner Suhner, Trimmis, Switzerland, assignor to Inventa AG fur Forschung und Patentverwertung, Zurich, Zurich, Switzerland

Filed May 23, 1977, Ser. No. 799,493

Int. Cl.[2] C08G *69/46*

U.S. Cl. 528—323 **21 Claims**

1. A method of continuously transferring pourable solids and controlling the flow thereof which comprises

mixing said solids with a liquid of lesser density to form a mixture,

moving said mixture downwardly into an inlet zone so that said inlet zone is filled with liquid,

moving said mixture downwardly from said inlet zone into a rotary zone, said rotary zone comprising radially directed, circumferentially spaced apart volumes which are rotating at a uniform speed,

conveying discrete portions of said mixture along a path that describes a section of a circle by means of said volumes to an outlet zone circumferentially spaced apart from said inlet zone,

emptying said mixture from said rotating volumes into said outlet zone,

injecting an additional liquid of lesser density than said solids into or adjacent said volumes at said outlet zone to produce a turbulence in said volumes and said outlet zone so that said solids empty from said volumes into said outlet zone, and said outlet zone is filled with said liquid and said additional liquid,

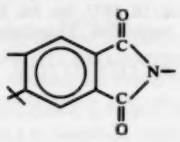
controlling the movement of said mixture from said inlet zone into said rotary zone by selectively withdrawing said liquid from said rotary zone and after the emptying of said volumes so that the movement of said mixture into said rotary zone results in a level of solids in said volumes which is below a level at which said solids are damaged by said rotating volumes and rotary zone.

4,145,522
POLYIMIDE FROM AMINO SUBSTITUTED 4-T-BUTYLPHTHALIC ANHYDRIDE

Robert G. Keske, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 700,583, Jun. 28, 1976, Pat. No. 4,078,142.
This application Sep. 8, 1977, Ser. No. 831,593
Int. Cl.[2] C08G *69/12*
U.S. Cl. 528—331 3 Claims

1. A thermally stable solid polyimide containing at least 1 percent of a structural unit of the formula



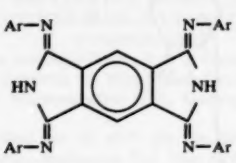
wherein the dangling cross valence extending from the benzene moiety represents the t-butyl substituent.

4,145,523
ORGANOMETALLIC POLYMERS (A)

Walter O. Siegl, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

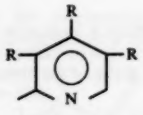
Filed May 4, 1977, Ser. No. 793,587
Int. Cl.[2] C08G *83/00, 79/00*
U.S. Cl. 528—395 12 Claims

1. A method for preparing organometallic polymers of alternatively perpendicular bis-chelates which comprises (1) contacting in liquid medium bis-chelate ligand (A) corresponding to the formula



I

wherein Ar is:



(a)

or

(b)

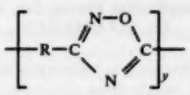
and each R independently is hydrogen, halogen or an organic radical of up to about 100 carbon atoms with divalent, hexacoordinate, transition metal salt (B), and (2), optionally thereafter contacting additional bis-chelate ligand (A) with the product obtained in (1).

4,145,524
PREPARATION OF HETEROCYCLIC BLOCK COPOLYMER FROM PERFLUOROALKYLENE OXIDE α, ω-DIAMIDOXIMES

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Leonard O. Ross, Sunnyvale, and Robert W. Rosser, San Jose, both of Calif.

Filed Oct. 17, 1977, Ser. No. 843,090
Int. Cl.[2] C08G *73/06*
U.S. Cl. 528—401 7 Claims

1. A process for preparing a heat and chemical resistant polymer having the formula:



wherein y is an integer of at least 2 and is commensurate with a molecular weight range of about 3000 to about 50,000, and R represents identical bivalent organic radicals or any combination of bivalent organic radicals selected from the group consisting of $-(CX_2)_p-$, wherein p ranges from 2 to 8 when X is fluorine and 2 to 18 when X is hydrogen, chlorine, nitro or aryl; arlene; and an oligomeric or polymeric radical prepared by reacting a dicarboxylic acid halide with a fluorinated epoxide and having the formula:

$$CFY(OCF_2CFY)_mO(CS_2)p\ O(CFYCF_2O)_n\ CFY$$

wherein Y is fluorine or trifluoromethyl, X is nitro, aryl, hydrogen, chlorine or fluorine, p ranges from 1 to 18 and m+n ranges from 2 to 7, which comprises:

thermally condensing a diamidoxime monomer of the formula:

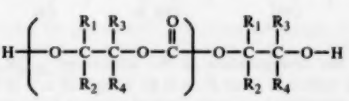
wherein R is as defined above.

4,145,525
END CAPPED POLYALKYLENE CARBONATES

Dale D. Dixon, Kutztown; Michael E. Ford, Center Valley, and Gerald J. Mantell, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 3, 1977, Ser. No. 838,810
Int. Cl.[2] C08G *63/62*
U.S. Cl. 528—404 13 Claims

1. A process for improving the thermal stability of a normally solid polycarbonate having substantially alternating epoxide and carbon dioxide units and having a plurality of free hydroxyl groups represented by the formula:



wherein:

R_1 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_3 is hydrogen, a halomethyl group, or a hydrocarbyl group having from 1 to 6 carbon atoms;

R_2 and R_4 are hydrogen or a hydrocarbyl group having from 1 to 6 carbon atoms; or

R_1, R_2, R_3 and R_4 are combined together constituting a carbocyclic ring of from 4 to 7 carbon atoms;

which comprises end-capping at least a portion of the free

hydroxyl groups of said polycarbonate by reacting said hydroxyl groups with a hydroxyl reactive phosphorus compound having the ability to replace the active hydrogen atom on said hydroxyl group for forming an oxygen-phosphorus bond, said reaction being carried out under conditions sufficient for effecting said reaction.

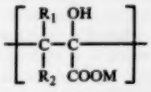
4,145,526

PROCESS FOR DEPOLYMERIZING HYDROXYCARBOXYLIC POLYMERS

Nöel Vanlautem, Wavre, and Jacques Gilain, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Jan. 9, 1978, Ser. No. 868,467
Claims priority, application France, Jan. 10, 1977, 77 00669
Int. Cl.[2] C08F *8/50*
U.S. Cl. 528—481 **11 Claims**

1. Process for obtaining a hydroxycarboxylic polymer of reduced molecular weight from a corresponding polymer of higher molecular weight, the hydroxycarboxylic polymer containing monomer units of the formula



in which R_1 and R_2 represent hydrogen or an alkyl group containing from 1 to 3 carbon atoms which can be substituted by a hydroxyl group or by a halogen atom, and R_1 and R_2 can be identical or different, and where M represents hydrogen, an alkali metal atom or an ammonium group comprising heating the said polymer of higher molecular weight in a gaseous medium to a temperature of between 60° and 240° C., said polymer of higher molecular weight having a Flory average molecular weight greater than about 3,000.

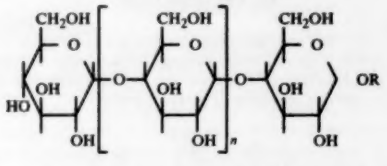
4,145,527

NITRO AROMATIC GLYCOSIDES

Richard C. Burns, and Alexander L. Johnson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

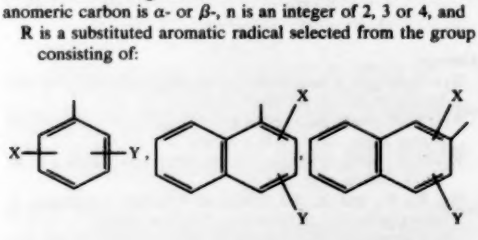
Continuation-in-part of Ser. No. 704,975, Jul. 13, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,303
Int. Cl.[2] C07H *15/04*
U.S. Cl. 536—4 **12 Claims**

1. A compound having the formula:



wherein the configuration of the substituent —OR on the anomeric carbon is α- or β-, n is an integer of 2, 3 or 4, and

R is a substituted aromatic radical selected from the group consisting of:



wherein X and Y are individually H, NO_2 halogen, alkyl of 1 to 4 carbon atoms, OR^1 or CO_2R^1, where

R^1 is an alkyl group of 1 to 6 carbon atoms, with the proviso that at least one of X and Y is NO_2.

4,145,528

PROCESS FOR PREPARING β-METHYLDIGOXIN

Borut Pelan; Marija Milohnoja, and Magda Pezdirc, all of Ljubljana, Yugoslavia, assignors to LEK tovarna farmacevtskih in kemicnih izdelkov, n.sol.o., Ljubljana, Yugoslavia

Filed Aug. 10, 1977, Ser. No. 823,379
Claims priority, application Yugoslavia, Aug. 20, 1976, 2046/76
Int. Cl.[2] C07J *17/00*
U.S. Cl. 536—7 **7 Claims**

1. In a process for preparing β-methyldigoxin by selective monomethyletherification of digoxin in a dimethyl formamide solution wherein the improvement comprises carrying out the reaction in an inert atmosphere using methyl esters of organic or inorganic sulphuric acids as methylating agents in the presence of strontium hydroxide and in addition to said dimethyl formamide in the presence of an inert solvent at ambient temperature, and isolating said β-methyldigoxin from the purified crude methylation product by column chromatography on SiO_2 with a mixture of a chlorinated hydrocarbon and a lower alkanol.

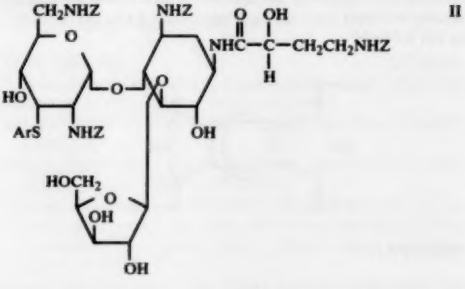
4,145,529

PRODUCTION OF 3'-DEOXYBUTIROSINA A

Peter W. K. Woo, and Theodore H. Haskell, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

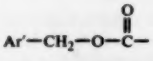
Filed Jul. 31, 1975, Ser. No. 600,677
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 536—17 **2 Claims**

1. Process for the production of 3'-deoxybutirosin which comprises reducing a compound of the formula

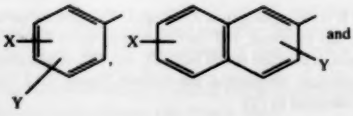


II

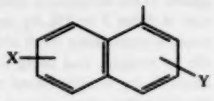
with a reducing agent which is molecular hydrogen in the presence of a noble metal catalyst or sodium in liquid ammonia, wherein Z is a protective group of the formula



and each of Ar and Ar' is an aryl group having one of the formulas



-continued



wherein each of X and Y is hydrogen, halogen, nitro, lower alkyl of from one to four carbon atoms, or lower alkoxy of from one to four carbon atoms.

4,145,530

2'-DEAMINO-3'-EPIAMINO-3'-DEOXY-XK-88-5 AND PROCESS FOR THE PRODUCTION THEREOF

Hideo Matsushima, Machida, and Yasuki Mori, Kawasaki, both of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

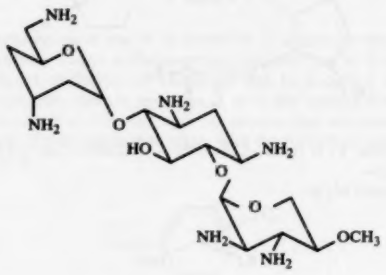
Filed Dec. 23, 1977, Ser. No. 863,628

Claims priority, application Japan, Dec. 24, 1976, 51-154900

Int. Cl.[2] C07H *15/22*; A61K *31/71*

U.S. Cl. 536—17 **2 Claims**

1. 2'-deamino-3'-epiamino-3'-deoxy-XK-88-5 represented by the formula:



and pharmaceutically acceptable acid addition salts thereof.

4,145,531

PROCESS FOR PRODUCING 2'-SUBSTITUTED-D-RIBOFURANOSYL PURINE COMPOUNDS

Fritz Eckstein, and John Hobbs, both of Gottingen, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V., Gottingen, Fed. Rep. of Germany

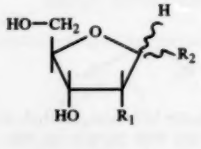
Filed Apr. 28, 1977, Ser. No. 792,077

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2628202

Int. Cl.[2] C07H *19/06*

U.S. Cl. 536—26 **11 Claims**

1. Process for the preparation of a 2'-substituted-D-ribofuranosyl purine compound of the formula



(I)

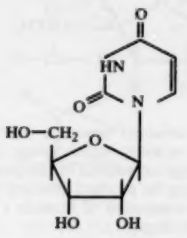
in which

R_1 is azide, amino, halogen or alkoxy, and

R_2 is the residue of a purine base and particularly a 9-adenyl group, a 7-guanyl group, or a 9-guanyl group (the waved lines in formula I above show that R_2 can be bound in the α- or β-configuration),

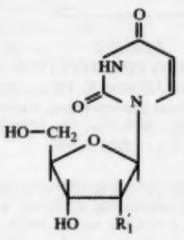
which process comprises

(a) converting a uridine of the formula



(II)

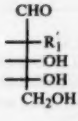
into the corresponding R_1' substituted compound III below, by reacting the derived O^2, 2'-cyclouridine with an alkali azide (when R_1' is azide) or with a halide (when R_1', is halogen) or the uridine with an alkylation agent (when R_1' is alkoxy)



(III)

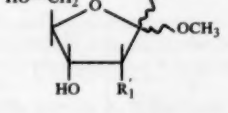
wherein R_1' is azide, halogen, or alkoxy;

(b) transforming Compound III with hydrazine into a 2-deoxy-ribose compound of the formula IV



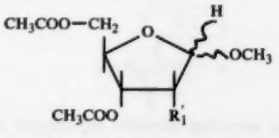
(IV)

(c) converting the 2-deoxy-ribose compound IV with methanol in the presence of a strong acid into a 1-O-methyl-glucoside of the formula V



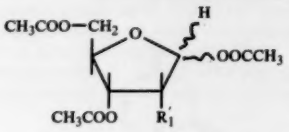
(V)

(d) reacting the glucoside V with acetic anhydride, in a polar organic solvent, to form a 1-O-methyl-ribose-3,5-diacetate of formula VI



(VI)

(e) converting the diacetate VI with acetic anhydride in glacial acetic acid, in the presence of a strong acid into a ribose-1,3,5-triacetate of formula VII



(VII)

(f) condensing the obtained triacetate with a purine base wherein the free primary amino group is protected by acylation, in an organic solvent in the presence of Lewis acid and converting the product obtained to split the acyl group yielding a compound of formula I in which R_1 is azide, halogen, or alkoxy;

(g) optionally separating the product obtained into its α and β anomers; and

(h) optionally reacting Compound I in which R_1 is azido with triphenylphosphine in saturated methanolic ammonia, into the corresponding Compound I where R_1 is amino;

wherein R_1' in formulas IV, V, VI and VII is defined as in formula III above.

4,145,532

PROCESS FOR MAKING PRECIPITATED CELLULOSE

Neal E. Franks, Enka, and Julianna K. Varga, Asheville, both of N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 25, 1977, Ser. No. 854,957
Int. Cl.[2] C08B *16/00*
U.S. Cl. 536—56 **10 Claims**

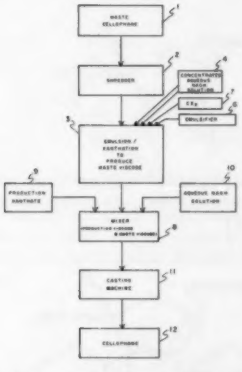
1. In a process for precipitating cellulose from a solution thereof which comprises dissolving cellulose in a solvent for the cellulose containing a tertiary amine oxide and thereafter shaping the solution and separating the cellulose from the tertiary amine oxide, the improvement wherein the solution is prepared by a process which comprises dissolving from 10–35% by weight cellulose in a solvent for the cellulose which comprises a tertiary amine oxide and from about 1.4% to about 29% by weight of water.

4,145,533

METHOD FOR RECYCLING REGENERATED CELLULOSE SCRAP

Dennis L. Farrall, Hendersonville, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed Jul. 26, 1978, Ser. No. 928,182
Int. Cl.[2] C08B *9/08*
U.S. Cl. 536—60 **7 Claims**



1. A method for recycling uncoated regenerated cellulose scrap and waste material comprising (a) shredding the scrap, (b) emulsion-xanthating the shredded scrap in an aqueous solution of sodium hydroxide and carbon disulfide at a temperature ranging between 18° C. to 30° C. to produce a gel-free scrap viscose while controlling the amount of cellulose scrap added to the solution to maintain the total cellulose concentration at from 3 to 5% by weight of the solution, said solution initially containing from about 10.3 to 11.3% sodium hydroxide by weight, and using for xanthation at least 38% carbon disulfide by weight based on the weight of the cellulose, (c) blending the scrap viscose in amounts up to 15% by weight with conventional production viscose, and (d) using the resulting mixture to produce high quality regenerated cellulose products.

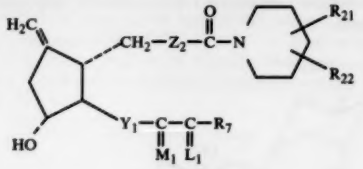
4,145,534

9-DEOXY-9-METHYLENE-PFG$_1$-PIPERIDYLAMIDES

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 7, 1978, Ser. No. 894,214
Int. Cl.[2] C07C *177/00*; C07D *211/16, 211/34*
U.S. Cl. 542—426 **32 Claims**

1. A prostaglandin analog of the formula



wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2C-H_2—

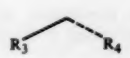
wherein M_1 is

or

wherein R_5 is hydrogen or methyl;

wherein L_1 is

or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein Z_2 is

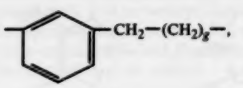
(1) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,

(2) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,

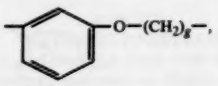
(3) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,

(4) —C≡C—CH_2—$(CH_2)_g$—CH_2—,

(5) —CH_2—C≡—$(CH_2)_g$—CH_2—,

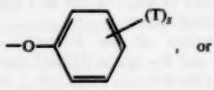


(6)

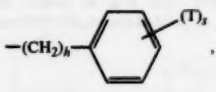


(7)

wherein g is one, 2 or 3;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,



(2)



(3)

wherein m is one to 5, inclusive, h is zero or one, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is

wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive.

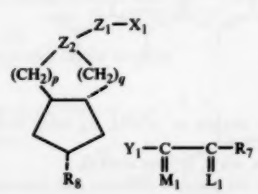
4,145,535

PYRAN ANALOGS OF TRANS-4,5-DIDEHYDRO-PGI COMPOUNDS

Donald E. Ayer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

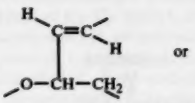
Continuation-in-part of Ser. No. 821,542, Aug. 3, 1977. This application Apr. 5, 1978, Ser. No. 893,772
Int. Cl.[2] C07D *311/02*
U.S. Cl. 542—426 **55 Claims**

1. A prostacyclin analog of the formula

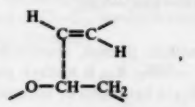


wherein Z_2 is

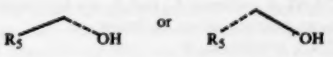
(1)



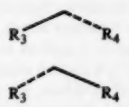
(2)



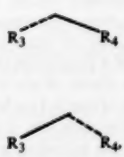
wherein one of p and q is the integer one and the other is the integer zero;
wherein Z_1 is
(1) $-(CH_2)_g-CH_2-CH_2-$, or
(2) $-(CH_2)_g-CH_2-CF_2-$,
wherein g is the integer zero, one, or 2;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—, or
(3) $-CH_2CH_2-$,
wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,
wherein L_1 is

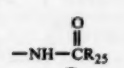


or a mixture of

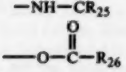


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein X_1 is
(1) $-COOR_1$ wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by

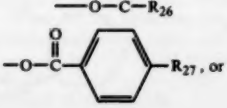
(a)



(b)



(c)



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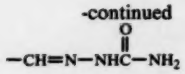
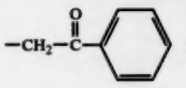


(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{26} is methyl, phenyl, $—NH_2$, or methoxy; and R_{27} is hydrogen or acetamido; inclusive, phenacyl, i.e.,



phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;

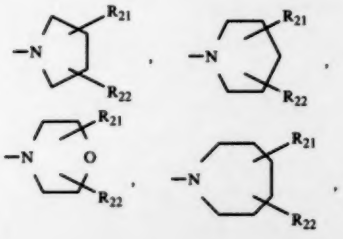
(2) $—CH_2OH$;

(3) $—CH_2NL_2L_3$ wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; or

(4) $—COL_4$, wherein L_4 is

(a) amino of the formula $—NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro; carboxyalkyl of one to 4 carbon atoms, inclusive; carbamoylalkyl of one to 4 carbon atoms, inclusive; cyanoalkyl of one to 4 carbon atoms, inclusive; acetylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, alkoxy of one to 3 carbon atoms, inclusive; carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive; or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; or alkoxy of one to 3 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms inclusive; hydroxy, alkoxy of one to 3 carbon atoms, inclusive; hydroxyalkyl of one to 4 carbon atoms, inclusive; dihydroxyalkyl of one to 4 carbon atoms, and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



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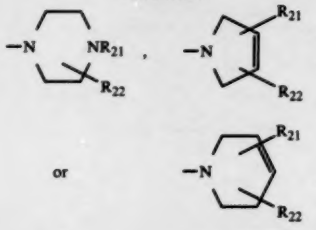


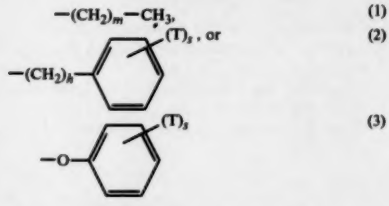
wherein R_{21} and R_{22} are as defined above;

(c) carbonylamino of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(d) sulphonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

(e) hydrazino of the formula $—NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula $—NR_{21}R_{22}$, as defined above, or cycloamino, as defined above;

wherein R_7 is



(1)

(2)

(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when X_1 is $—CH_2NL_2L_3$.

4,145,536

PHOTOCHROMIC COMPOUNDS

Harold G. Heller, 11 Erwgoch, Waunfawr, Aberystwyth, Dyfed SY23 3AZ, Wales

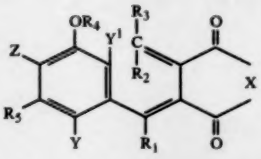
Continuation-in-part of Ser. No. 502,095, Aug. 30, 1974, abandoned. This application May 31, 1977, Ser. No. 801,915

Claims priority, application United Kingdom, Sep. 1, 1973, 41233/73

Int. Cl.[2] C07D 207/12

U.S. Cl. 542—441 **12 Claims**

1. A photochromic compound of the general formula:



(1)

wherein

X represents oxygen or $>NR_6$, R_6 being hydrogen, alkyl, aryl or aralkyl,

R_1 represents, alkyl, aryl or aralkyl,

Y and Y^1 are the same or different and represent hydrogen, alkyl, halogen or alkoxy,

Z represents hydrogen, halogen, alkyl, alkoxy or aryloxy.

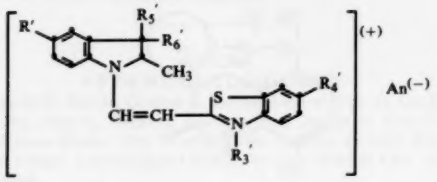
R_5 represents hydrogen, alkyl, alkoxy or aryloxy,
R_4 represents alkyl, aryl or aralkyl, and
R_2 and R_3 represent the same or different alkyl, aralkyl or aryl groups or one of R_2 and R_3 represents hydrogen and the other is alkyl, aryl or aralkyl.

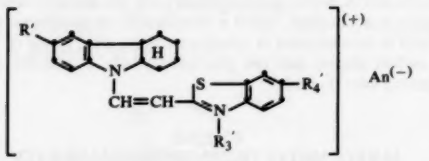
4,145,537
CATIONIC DYESTUFFS

Hubertus Psaar, and Roderich Raue, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 15, 1974, Ser. No. 514,999
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1973, 2353537
Int. Cl.² C07D *417/06*
U.S. Cl. 542—465 **5 Claims**

1. Cationic dyestuffs, characterized in that they correspond to the formulae





in which

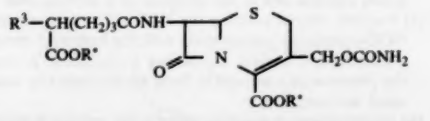
R′ denotes hydrogen, or a C_1–C_4-alkyl, C_1–C_4-alkoxy, benzyloxy, C_1–C_4-alkylamino, benzylamino or C_1–C_4-alkylcarbonylamino group,
R'_3 denotes a C_1–C_4-alkyl or benzyl radical,
R'_5 and R'_6 independently of one another denote hydrogen or a methyl group,
R'_4 denotes hydrogen, a C_1–C_4-alkyl, C_1–C_4-alkoxy, benzyloxy, C_1–C_4-alkylamino, benzylamino, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkylsulphonamido or nitro group or chlorine and
$An^{(-)}$ denotes an anion.

4,145,538
3-CARBAMYLOXYMETHYL-CEPHALOSPORINS

Ramakrishnan Nagarajan, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 683,984, May 6, 1976, abandoned, which is a division of Ser. No. 374,222, Jun. 27, 1973, abandoned, which is a division of Ser. No. 139,913, May 3, 1971, abandoned. This application Sep. 7, 1977, Ser. No. 831,324
Int. Cl.² C07D *501/60*
U.S. Cl. 544—16 **5 Claims**

1. The compound of the formula



wherein R^o represents hydrogen or R^1, and R^1 represents alkyl of C_1–C_6, 2,2,2-trichloroethyl, 2-iodoethyl, tert-alkenyl of C_5–C_7, tert-alkynyl of C_5–C_7, benzyl, nitrobenzyl, tetrahydropyranyl, succinimidomethyl, phthalimidomethyl, methoxybenzyl, dimethoxybenzyl, cyanomethyl, nitrophenyl, dinitrophenyl, 2,4,6-trinitrophenyl, bis(p-methoxyphenyl)methyl, triphenylmethyl, diphenylmethyl, benzyloxymethyl, loweralkanoyloxymethyl of C_3–C_6, loweralkanoyl of C_2–C_4, phenacyl, or radical of the formula

wherein each R^2 independently represents loweralkyl of C_1–C_4 or halo selected from the group consisting of bromo, chloro, fluoro, and iodo, subject to the limitation that at least one R^2 represents loweralkyl as defined; and R^3 represents amino or an acylamido group where the acyl group is:

alkanoyl of C_1–C_4,
aroyl of C_6–C_{12},
alkoxycarbonyl of C_1–C_4,
benzyloxycarbonyl,
cycloalkoxycarbonyl of C_5–C_6,
aryloxycarbonyl of C_6–C_{12},
one of the above groups substituted with from one to three groups, each selected from the group consisting of halo, nitro, loweralkoxy of C_1–C_4, cyano, and, in the instance of aroyl and aryloxy, by loweralkyl of C_1–C_4, or phthaloyl, subject to the limitation that at least one of the following exists: (1) R^o represents R^1; or (2) R^3 represents acylamido as defined.

4,145,539
PROCESS FOR ISOLATION AND PURIFICATION OF CEPHALOSPORIN COMPOUND

Kiyoshi Hattori, Takarazuka, and Takashi Mitamura, Ibaragi, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 15, 1977, Ser. No. 788,012
Claims priority, application Japan, Apr. 20, 1976, 51/45131
Int. Cl.² C07D *501/12*
U.S. Cl. 544—20 **9 Claims**

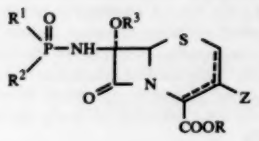
1. In the process for the isolation of a cephalosporin compound from a solution thereof in admixture with impurities, by treating the solution with macroporous, non-ionic styrene-divinylbenzene copolymer adsorption resin and then eluting the adsorbed cephalosporin compound from the resin, the improvement of eluting the adsorbed cephalosporin compound from the resin with an aqueous solution of anionic surface active agent selected from alkali metal (higher) alkyl sulfate and alkylbenzenesulfonate.

4,145,540
7β-PHOSPHORAMIDO-7α-METHOXYCEPHALOSPORANIC ACID DERIVATIVES

Michihiko Ochiai, Suita; Akira Morimoto, Ikeda; Osami Aki, Kawanishi, and Taiiti Okada, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 26, 1976, Ser. No. 708,755
Claims priority, application Japan, Jul. 24, 1975, 50-90743
Int. Cl.² C07D *501/18*
U.S. Cl. 544—21 **12 Claims**

1. A compound of the formula



wherein

R^1 and R^2, independently of each other, are alkoxy of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms substituted by halogen, benzyloxy, phenyl, phenoxy, or phenoxy substituted by one member selected from the group consisting of nitro, methyl, methoxy and halogen,

R^3 is methyl,

R is selected from the group consisting of hydrogen, benzyl, p-nitrobenzyl, p-halogenobenzyl, pivaloyloxymethyl, dimethylsilyl, trimethylsilyl, methoxysilyl, benzhydryl, methoxymethyl, trichloroethyl, methylsulfonylethyl, benzoylmethyl, t-butyl, methoxybenzyl, trityl, methylthiomethyl, α-acetoxy-butyl and 1-pivaloyloxy-ethane-1-yl, and

Z is a group of the formula $—CH_2X$ where X is selected from the group consisting of (1) hydrogen, (2) alkoxy of 1–3 carbon atoms, (3) alkylthio of 1–3 carbon atoms, (4) azido, (5) carbamoyloxy, (6) carbamoyloxy substituted by alkyl of 1–3 carbon atoms, (7) thiocarbamoylthio, (8) aliphatic acyloxy selected from the group consisting of acetyloxy, propionyloxy and butyryloxy, and (9) heterocyclylthio selected from the group consisting of pyridylthio, N-oxide-pyridylthio, pyrimidylthio, pyridazinylthio, N-oxide-pyridazinylthio, pyrazolylthio, diazolylthio, thiazolylthio, 1,2,3-thiazolylthio, 1,2,4-thiadiazolylthio, 1,3,4-thiadiazolylthio, 1,2,5-thiadiazolylthio, 1,2,3-oxadiazolylthio, 1,2,4-oxadiazolylthio, 1,3,4-oxadiazolylthio, 1,2,5-oxadiazolylthio, 1,2,3-triazolylthio, 1,2,4-triazolylthio, 1H-tetrazolylthio and 2H-tetrazolylthio, each of said heterocyclylthio groups being unsubstituted or substituted by at least one member selected from the group consisting of alkyl of 1–3 carbon atoms, alkoxy of 1–3 carbon atoms, halogen, trifluoromethyl, trichloroethyl, hydroxyl, mercapto, amino, carboxyl and carbamoyl,

the sulfur atom in the above formula (II) being in the oxide or non-oxide form,

or a salt of said compound.

4,145,541

3,3-DICHLORO-2-AZETIDINONE DERIVATIVES HAVING BASIC SUBSTITUENTS

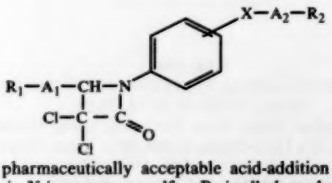
John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 803,827, Jun. 6, 1977, Pat. No. 4,115,382. This application Jun. 30, 1978, Ser. No. 920,768

Int. Cl.[2] C07D *413/12*

U.S. Cl. 544—111 **6 Claims**

1. A compound having the formula



or a pharmaceutically acceptable acid-addition salt thereof, wherein X is oxygen or sulfur; R_1 is alkyl, cycloalkyl or aryl; R_2 is 1-pyrrolidinyl, 1-piperidinyl,4-morpholinyl, 1-piperazinyl or 4-alkyl-1-piperazinyl; A_1 is a saturated bond or an alkylene group having 1 to 4 carbon atoms; and A_2 is an alkylene group having 2 to 5 carbon atoms; wherein aryl is phenyl or phenyl substituted with a halogen, alkyl, alkoxy, trifluoromethyl, or nitro group; alkyl and alkoxy are groups having 1 to 6 carbon atoms; and cycloalkyl is a group having 3 to 7 carbon atoms.

4,145,542

5-[1-HYDROXY-2-(HETEROCYCLIC-AMINO)]ALKYL-8-HYDROXY-3,4-DIHYDROCARBOSTYRIL DERIVATIVES

Kazuyuki Nakagawa, Tokushima; Shiro Yoshizaki, Naruto; Shigeharu Tamada, and Kaoru Tanimura, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

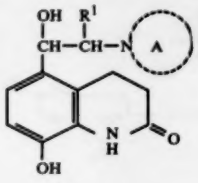
Continuation-in-part of Ser. No. 536,516, Dec. 26, 1974, Pat. No. 3,994,901. This application Nov. 29, 1976, Ser. No. 745,894

Claims priority, application Japan, Jun. 13, 1974, 49-67824

Int. Cl.[2] C07D *413/06, 401/06*

U.S. Cl. 544—128 **3 Claims**

1. A 5-[1-hydroxy-2-(heterocyclic-amino)]alkyl-8-hydroxy-3,4dihydrocarbostyril derivative having the formula



(I)

wherein R^1 represents an alkyl group having 1 to 4 carbon atoms, and A, when taken together with the nitrogen atom to which it is attached, forma a morpholino or piperazino ring which is unsubstituted or substituted by an alkyl group of 1 to 4 carbon atoms, and the pharmaceutically acceptable acid addition salts thereof.

4,145,543

ALKALI METAL DICHLOROISOCYANURATE COMPOSITIONS

John A. Wojtowicz, Cheshire, and William C. Herms, Meriden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 8, 1976, Ser. No. 721,261

Int. Cl.[2] C07D *251/36*

U.S. Cl. 544—190 **7 Claims**

1. A composition comprising sodium dichloroisocyanurate and a proportion of an alkali metal chloride wherein said proportion of said alkali metal chloride is from about 6 percent to about 14 percent by weight of said sodium dichloroisocyanurate.

4,145,544

PREPARATION OF ISOCYANURATES

Erich Kuehn, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jul. 27, 1977, Ser. No. 819,237

Int. Cl.[2] C07D *251/34*

U.S. Cl. 544—222 **9 Claims**

1. In a process for preparing an ethylenically unsaturated isocyanurate which comprises

(1) a first step of trimerizing an aromatic polyisocyanate to form an NCO-containing isocyanurate, said trimerizing being conducted in the presence of an isocyanate trimerization catalyst and in the presence of a solvent, and

(2) a second step of reacting the NCO groups present in the NCO-containing isocyanurate with the hydroxyl group of a monohydric alcohol containing a vinylidene group, in the presence of a solvent to form an ethylenically unsaturated isocyanurate,

the improvement comprising using as the solvent in steps (1) and (2) a vinylidene solvent which is free of a group

reactive with an isocyanate group and which comprises at least 20 weight percent of an ethylenically unsaturated polar solvent.

4,145,545
PROCESS FOR PREPARING TETRAHYDROPYRIMIDINES

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 292,494, Sep. 27, 1972, Pat. No. 4,085,084. This application Jun. 15, 1977, Ser. No. 806,878
Int. Cl.[2] C07D *239/06*
U.S. Cl. 544—242 **8 Claims**

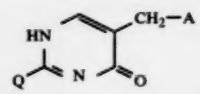
1. A process of preparing 2,3,4,5-tetrahydropyrimidines which comprises reacting at ambient temperatures and pressures a carbonyl compound from the group consisting of aldehydes and ketones with ammonia or ammonium hydroxide in the presence of 0.1 to 2.0 mole percent, based upon the reactants of carbon disulfide as a catalyst.

4,145,546
4-PYRIMIDONE COMPOUNDS

Thomas H. Brown; Graham J. Durant, both of Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Continuation-in-part of Ser. No. 726,885, Sep. 27, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,234
Int. Cl.[2] C07D *239/56*
U.S. Cl. 544—310 **3 Claims**

1. A compound of the formula:



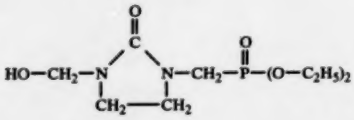
in which Q is loweralkylthio or benzylthio and A is a 1,3-benzodioxolyl or a 2,3-dihydro-1,4-benzodioxinyl ring.

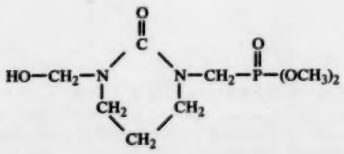
4,145,547
UREIDOALKYLPHOSPHONATES AND THEIR USE FOR THE FLAMEPROOFING OF TEXTILES

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 356,526, May 2, 1973, Pat. No. 4,044,006, which is a division of Ser. No. 50,304, Jun. 26, 1970, Pat. No. 3,763,281. This application May 26, 1977, Ser. No. 800,975
Int. Cl.[2] C07D *233/02, 239/04, 251/04*
U.S. Cl. 548—320 **2 Claims**

1. The ureidoalkylphosphonates selected from the group consisting of:





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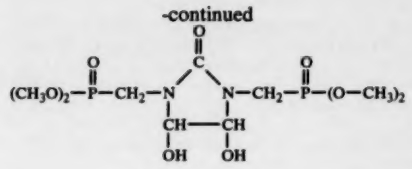
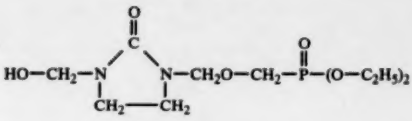
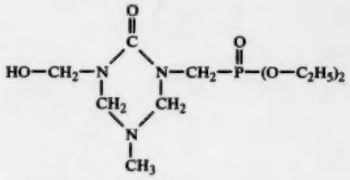
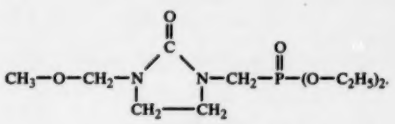






2. A ureidoalkylphosphonate corresponding to the formula:



4,145,548
METHOD FOR THE PRODUCTION OF 5-NITROSO-2,4,6-TRIAMINOPYRIMIDINE

David Rose, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,287
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651794
Int. Cl.[2] C07D *239/50*
U.S. Cl. 544—323 **11 Claims**

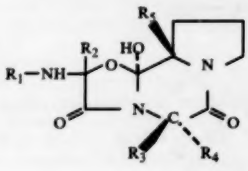
1. An improved process for the production of 5-nitroso-2,4,6-triaminopyrimidine consisting essentially of the steps of:
(1) introducing an arbitrary guanidine salt into a water-miscible lower aliphatic alcohol,
(2) adding a basic reacting compound in a stoichiometric excess and malonic acid dinitrile thereto,
(3) heating the reaction mixture to reflux under normal pressure for from 30 minutes to six hours,
(4) cooling the reaction mixture to from 20° C. to 50° C.,
(5) adjusting the reaction mixture to an acid pH with at least a stoichiometric excess of an acid,
(6) adding water to the acid-adjusted reaction mixture in an amount of from 0.5 to 4 times the volume of the acid-adjusted reaction mixture,
(7) reacting said acid-adjusted aqueous reaction mixture with nitrous acid under nitrosating conditions, and
(8) recovering said 5-nitroso-2,4,6-triaminopyrimidine without isolation of any intermediately formed products.

4,145,549
PROCESS FOR PREPARING OXAZOLO[3,2-a]PYRROLO[2,1-c]PYRAZINE DERIVATIVES

Paul Stadler, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jan. 7, 1977, Ser. No. 757,616
Claims priority, application Switzerland, Jan. 12, 1976, 269/76
Int. Cl.[2] C07D *519/02, 457/12, 207/08, 401/12*
U.S. Cl. 544—346 **22 Claims**

1. A process for the production of an aminocyclol of formula I



I

where

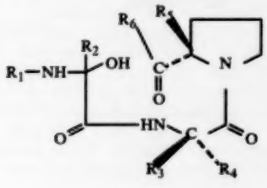
R_1 is an amino protecting group of lysergic acid residue,

R_2 is alkyl of 1 to 4 carbon atoms,

R_3 and R_5 are each independently hydrogen or alkyl of 1 to 5 carbon atoms,

R_4 is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, benzyl or benzyl monosubstituted by alkoxy of 1 to 4 carbon atoms,

which comprises the steps of intramolecularly cyclizing a compound of formula II



II

wherein

R_1 to R_5 are as defined above and

R_6 is N-succinimidoxy, phenoxy, phenythio, phenoxy or phenylthio independently substituted with 1 to 3 substituents selected from methyl, halogen and nitro or phenoxy or phenythio substituted with 1 to 5 fluoro or chloro substituents,

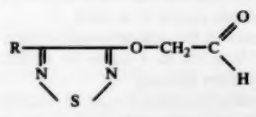
by splitting off R_6H under mild solvolytic conditions.

4,145,550
2-(4-SUBSTITUTED-1,2,5-THIADIAZOLE-3-YLOXY)-ACETALDEHYDES

Patrice C. Belanger, Dollard des Ormeaux, Canada, assignor to Merck Sharp & Dohme (I.A.) Corp., Rahway, N.J.

Division of Ser. No. 766,637, Feb. 8, 1977, Pat. No. 4,076,934, which is a continuation-in-part of Ser. No. 602,720, Aug. 7, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 835,094
Int. Cl.[2] C07D *285/10, 417/04*
U.S. Cl. 544—367 **1 Claim**

1. Compounds having the formula:



wherein

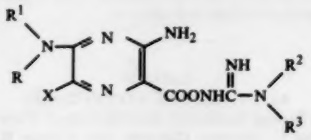
R is selected from the group consisting of, piperidyl, hydroxypiperidyl, N-C_1-C_4-alkylpiperazinyl, C_1-C_5 alkyl, C_1-C_5 alkoxy, phenyl, benzyl, furyl, thienyl and pyrryl.

4,145,551
PYRAZINE-2-CARBONYLOXYGUANIDINES

Edward J. Cragoe, Jr., Lansdale; Otto W. Woltersdorf, Jr., Chalfont, and Mark G. Bock, Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 9, 1978, Ser. No. 868,104
Int. Cl.[2] A61K *31/495;* **C07D** *241/28*
U.S. Cl. 544—407 **5 Claims**

1. A compound of the formula



wherein

R is hydrogen, lower alkyl having 1–5 carbon atoms, lower alkenyl having 2–5 carbon atoms or lower alkynyl having 2–5 carbon atoms;

R^1 is hydrogen, lower alkyl having 1–5 carbon atoms, lower alkenyl having 2–5 carbon atoms, or lower alkynyl having 2–5 carbon atoms;

R^2 is hydrogen, lower alkyl having 1–5 carbon atoms, phenyl, benzyl, or phenethyl;

R^3 is hydrogen, or lower alkyl having 1–5 carbon atoms;

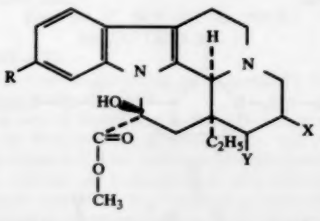
X is halogen.

4,145,552
PREPARATION OF VINCAMINE AND RELATED ALKALOIDS

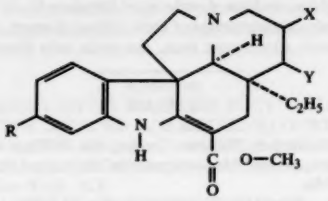
Alain Heymès, Portet, Garonne, France, assignor to Parcor, Paris, France

Filed Jul. 5, 1977, Ser. No. 812,473
Claims priority, application France, Jul. 13, 1976, 76 21432
Int. Cl.[2] C07D *519/04*
U.S. Cl. 546—51 **7 Claims**

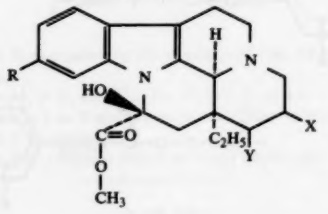
1. A process for preparing compounds of the formula:



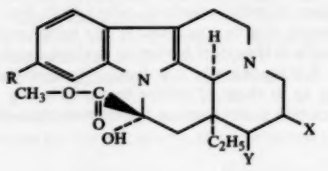
wherein R is hydrogen or methoxy and X and Y are hydrogen or together represent a supplementary valence bond between the carbon atoms to which they are bonded, comprising reacting a compound of formula:



with a carbanion-forming agent in a reaction medium; then introducing oxygen into the reaction medium until the medium ceases absorbing oxygen, a reducing agent compatible with oxygen being added to the reaction medium before the medium ceases absorbing oxygen; then acidifying the mixture and extracting therefrom a mixture of compounds of formula:



and



and separating these two compounds from each other; compounds wherein X and Y represent a supplementary bond being optionally reduced at any desired stage after the point when the absorption of oxygen ceases.

4,145,553

MANUFACTURE OF 4-NITROIMIDAZOLES

Matthias Wetzler, Ludwigshafen, and Toni Dockner, Meckenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

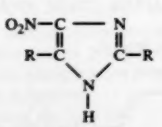
Filed Sep. 19, 1977, Ser. No. 834,414

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645172

Int. Cl.[2] C07D *233/02*

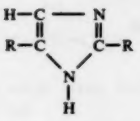
U.S. Cl. 548—338 **10 Claims**

1. A process for the manufacture of a 4-nitroimidazole of the formula



I,

where the individual radicals R are identical or different and each is hydrogen or an aliphatic radical which comprises: nitrating an imidazole with nitric acid in the presence of sulfuric acid and urea at an elevated temperature, in which an imidazole of the formula



II,

where R has the above meaning, is used for the reaction and water is removed from the reaction mixture by distillation during the reaction.

4,145,554

3-NITROPYRAZOLE DERIVATIVES

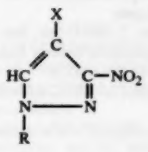
Reuben G. Jones, Cedar City, Utah, and Norman H. Terando, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 697,516, Jun. 18, 1976, Pat. No. 4,066,776, which is a continuation-in-part of Ser. No. 561,139, Mar. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 477,118, Jun. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 357,135, May 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 211,791, Dec. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 124,463, Mar. 15, 1971, abandoned. This application Oct. 13, 1977, Ser. No. 842,006

Int. Cl.[2] C07D *231/16*

U.S. Cl. 548—377 **15 Claims**

1. A compound of the formula



wherein

R represents

(A) C_3–C_4 epoxyalkyl,

(B) hydrogen

(C) C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_3–C_{10} alkynyl, C_3–C_{10} cycloalkyl, cyclopropylmethyl, C_3–C_{10} cycloalkenyl, C_2–C_{10} alkyl mono- or disubstituted with halo or C_1–C_3 alkoxy, or C_1–C_{10} alkyl monosubstituted with

(1) mercapto,

(2) carboxamido,

(3) keto oxygen,

(4) hydroxy,

(5) phthalimido,

(6) C_1–C_3 alkylthio,

(7) C_1–C_3 alkylsulfonyl,

(8) C_1–C_3 alkanoyl,

(9) phenyl,

(10) phenyl monosubstituted with

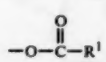
(a) C_1–C_3 alkyl,

(b) C_1–C_3 haloalkyl,

(c) hydroxy, or

(d) halo,

(11)



wherein R^1 represents

(a) C_1–C_3 alkyl,

(b) C_1–C_3 haloalkyl,

(c) C_3–C_6 cycloalkyl,

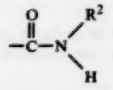
(d) phenyl, or

(e) phenyl monosubstituted with

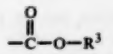
(1) C_1–C_3 alkyl,

(2) C_1–C_3 haloalkyl,
(3) halo, or
(4) hydroxy; and

X represents
(A) cyano,
(B)



wherein R^2 represents
(1) hydrogen, or
(2) C_1–C_6 alkyl; or
(C)



wherein R^3 represents C_1–C_6 alkyl; provided that a C_1 alkyl R group is substituted only with phenyl or substituted phenyl.

4,145,555

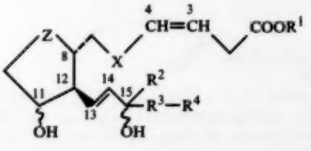
Δ^3-PROSTAGLANDIN ANALOGS

Masaki Hayashi; Seiji Kori, both of Takatsuki; Yoshinobu Arai, Toyonaka; Takanori Okada, Osaka, and Yoshitaka Konishi, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

Filed Mar. 7, 1977, Ser. No. 774,828
Claims priority, application United Kingdom, Mar. 12, 1976, 10118/76; Aug. 9, 1976, 331154/76
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 **19 Claims**

1. Prostaglandin analogues of the general formula:

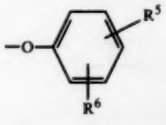
(VI)



wherein X represents cis or trans-vinylene, Z represent

or >C=O, R^1 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms, R^2 represents a hydrogen atom or a methyl group, R^3 represents a straight- or branched-chain alkylene group containing from 1 to 7 carbon atoms and R^4 represents a grouping of the formula:

(VIII)



(wherein R^5, and R^6, which may be the same or different, each represent a hydrogen atom or halogen atom, a trifluoromethyl group or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms), and (1) the double bond between C_3-C_4 is trans or cis, or trans and cis, when X is cis-vinylene, and (2) the double bond between C_3-C_4 is trans, when X is trans-vinylene, and the double bond between C_{13}-C_{14} is trans and cyclodextrin clathrates of such acids and esters, and when R^1 represents a hydrogen atom, non-toxic salts thereof.

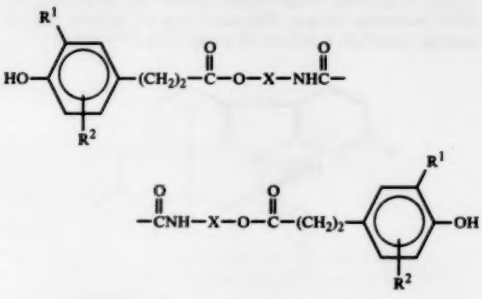
4,145,556

OXAMIDE STABILIZERS FOR ORGANIC MATERIALS

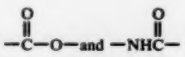
Richard H. Hirsch, Webster Groves, and William H. Selcer, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 21, 1977, Ser. No. 862,787
Int. Cl.[2] C07C *103/147*
U.S. Cl. 560—75 **20 Claims**

1. A compound having the structural formula



in which each R^1 independently is alkyl having up to about 8 carbon atoms including a tertiary carbon atom directly linked to the phenolic ring on which that R^1 is a substituent, each R^2 independently is H or alkyl having up to about 8 carbon atoms, and each X independently is a divalent hydrocarbon radical containing up to about 12 carbon atoms including from 1 to about 10 carbon atoms forming the shortest chain linking the adjacent



radicals in said compound.

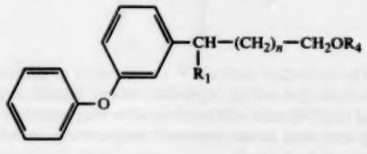
4,145,557

(PHENOXYPHENYL) ALKYL ACETATES, PROPIONATES, AND CARBAMATES

Winston S. Marshall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 608,614, Aug. 28, 1975, abandoned, which is a continuation of Ser. No. 379,020, Jul. 13, 1973, abandoned, which is a division of Ser. No. 122,999, Mar. 10, 1971, Pat. No. 3,972,934, which is a continuation-in-part of Ser. No. 828,756, May 28, 1969, Pat. No. 3,600,437, which is a continuation-in-part of Ser. No. 823,477, May 9, 1969, abandoned, and Ser. No. 752,801, Aug. 15, 1968, abandoned. This application Feb. 14, 1977, Ser. No. 768,140
Int. Cl.[2] C07C *125/04, 125/06, 69/22, 69/14*
U.S. Cl. 560—164 **7 Claims**

1. A compound of the formula



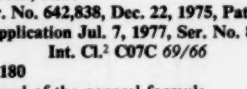
wherein n is 0-3; R_1 is hydrogen, C_1–C_5 alkyl, C_2–C_5 alkenyl, or C_2–C_5 alkynyl; and R_4 represents acetyl, propionyl, carbamyl, N-methylcarbamyl, or N,N-dimethylcarbamyl.

4,145,558
ESTER DERIVATIVES OF ETHER POLYCARBOXYLIC ACIDS

Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 642,838, Dec. 22, 1975, Pat. No. 4,058,554. This application Jul. 7, 1977, Ser. No. 813,733
Int. Cl.² C07C 69/66
U.S. Cl. 560—180 **2 Claims**

1. A compound of the general formula



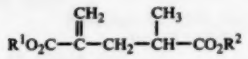
wherein R is a primary alkyl group of one to six carbon atoms,
wherein M_1 is H, Ca, Mg, Ba, Sr, Na, K or Li,
wherein x is 1 or 2 and is equivalent to the valency of M_1,
wherein Y is oxygen, and
wherein Z is 2-hydroxyethyl or 3-hydroxypropyl.

4,145,559
ESTERS OF 4-SUBSTITUTED 2-METHYLENEGLUTARIC ACIDS AND METHOD FOR PREPARING SAME

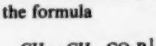
Joseph W. Nemec, and Richard B. Wuchter, both of Rydal, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 863,690, Oct. 3, 1969, abandoned. This application Nov. 6, 1974, Ser. No. 521,215
Int. Cl.² C07C 69/52
U.S. Cl. 560—190 **8 Claims**

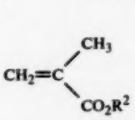
1. A process for the preparation of a compound of the formula



wherein R^1 and R^2 are individually alkyl groups of 1 to 18 carbon atoms, aryl groups of 6 to 10 carbon atoms, aralkyl groups of 7 to 12 carbon atoms, or dialkylaminoalkyl groups of 3 to 10 carbon atoms, which comprises contacting a compound of the formula

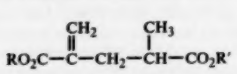


wherein R^1 is as defined above, with a compound of the formula



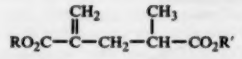
wherein R^2 is as defined above, in the presence of a catalytic amount of a tertiary organic phosphine, an organic phosphorus triamide, an organic phosphonous diamide, or an organic phosphinous amide as a catalyst.

7. A compound of the formula



wherein R is a 2-ethylhexyl group and R′ is a methyl group.

8. A compound of the formula



wherein R is an ethyl group and R′ is a 2-(N,N-dimethylamino)ethyl group.

4,145,560
PROCESS FOR MANUFACTURING TEREPHTHALIC ACID BY OXIDATION OF PARAXYLENE

Jacques Alagy, Lyon, and Quang Dang Vu, Paris, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 14, 1976, Ser. No. 676,818
Claims priority, application France, Apr. 14, 1975, 75 11749
Int. Cl.² C07C 51/33
U.S. Cl. 562—412 **10 Claims**

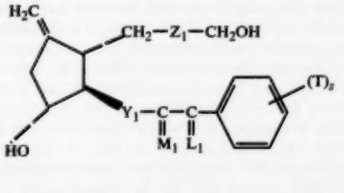
1. In a process for manufacturing benzene carboxylic acids by oxidation of benzene substituted with alkyl groups, in at least one reaction zone, in the liquid phase, by means of a gas containing molecular oxygen, in an aliphatic monocarboxylic acid at an average temperature T from about 80° to 260° C., at a pressure from about 2 to 30 kg/cm², in the presence of a transition metal compound as an oxidation catalyst, the improvement in which the internal wall of the reaction zone is preheated and maintained during the whole reaction time at an average temperature, expressed in ° C., from T − 10 to T + 100.

4,145,561
2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-16-PHENYL-PGF COMPOUNDS

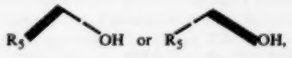
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,249, Apr. 11, 1977, Pat. No. 4,118,584. This application Jul. 12, 1978, Ser. No. 924,036
Int. Cl.² C07C 177/00
U.S. Cl. 568—807 **121 Claims**

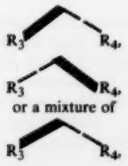
1. A prostaglandin analog of the formula



wherein
Y_1 is trans-CH=CH— or $-CH_2CH_2-$;
wherein
M_1 is



wherein
R_5 is hydrogen or methyl;
wherein
L_1 is



or a mixture of

-continued

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the provisio that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2— or
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—

wherein g is one, 2, or 3; and

wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,145,562

DC ARC FURNACE MELT ELECTRODE

Sven-Einar Stenkvist, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

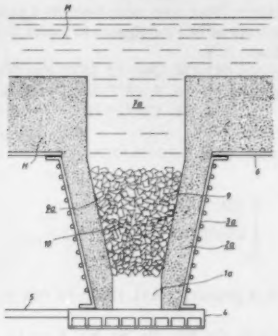
Filed Feb. 22, 1978, Ser. No. 880,148

Claims priority, application Sweden, Feb. 23, 1977, 7701974; Nov. 16, 1977, 7712918

Int. Cl.[2] **H05B** *7/00*

U.S. Cl. 13—1 **6 Claims**

1. A DC electric arc furnace having a hearth adapted to contain a melt and a melt electrode formed by a metal bar encased by a refractory encasement forming a passage containing the bar with the latter having an inner end contacted by said melt and an outer end adapted for connection with an electric power line, a portion of the bar adjacent to said inner end being formed as a melted portion by the heat of a melt in said hearth and a portion of said bar adjacent to said outer end being maintained as an unmelted portion by said encasement



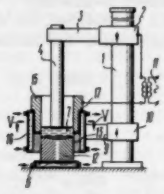
having means for cooling said bar, and particles having a higher density and melting temperature than said melt and which are distributed throughout at least said melted portion at least adjacent to said unmelted portion, said particles having a shape and size forming interconnecting spaces therebetween and which spaces are substantially filled by said melted portion so as to provide electrical conductivity to said melt.

4,145,563

PLANT FOR AND METHOD OF ELECTROSLAG REMELTING OF METALS AND ALLOYS

Volf I. Rabinovich; Jury N. Kriger, both of Chekhov; Alexandr I. Sapozhnikov; Igor A. Svitenko, both of Moscow; Viktor E. Sapunov, Chekhov; Vyacheslav V. Filippov, Chekhov, and Vladimir A. Karpov, Chekhov, all of U.S.S.R., assignors to Venjukovsky Armaturny Zavod, Chekhov, U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,227
Int. Cl.[2] H05B 3/60
U.S. Cl. 13—9 ES 23 Claims



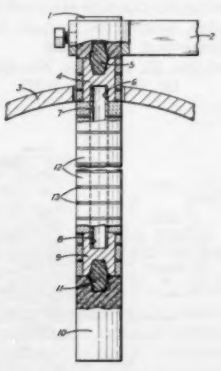
1. A plant for electroslag remelting of metals and alloys comprising: a bearing mast; a vertical transfer gear being secured on the bearing mast; an electrode holder mounted on the vertical transfer gear and adapted to hold a consumable electrode; a cooled base plate; a cooled mould mounted on the cooled base plate and adapted to contain a slag bath; at least one non-consumable electrode electrically non-associated with the cooled mould; an electric current supply source having different poles, one pole being connected to the electrode holder and the other pole being connected to the non-consumable electrode; and means for providing relative movement between the non-consumable electrode and the cooled base plate in a vertical direction.

4,145,564

NON-CONSUMABLE ELECTRODE WITH REPLACEABLE GRAPHITE TIP

Dennie J. Andrew, 12846 Rabbit Run La., Jacksonville, Fla. 32216, and Avery Hilton, Jr., 3483 Haitley Rd., Jacksonville, Fla. 32217

Filed Jan. 30, 1978, Ser. No. 873,473
Int. Cl.[2] H05B 7/08
U.S. Cl. 13—18 A 2 Claims



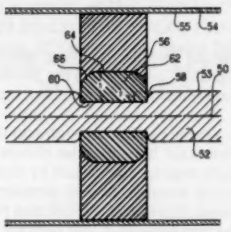
1. A non-consumable electrode for suspension from a holder in an electric arc furnace, comprising a metal tube having upper and lower ends, electrical conducting means rigidly connected with the upper end of the tube and extending above it for suspending the tube from a holder gripping said means, a lower metal member provided with threaded sockets in its top and bottom, the lower end of the tube being threaded and screwed into the upper socket, a threaded pin screwed into the lower socket and extending below it, a removable graphite electrode tip supported by said pin, refractory rings encircling said tube, and metal disks encircling the tube in engagement therewith and spacing the rings apart, the rings and disks being in engagement with one another to form a continuous unbroken protective sleeve extending upwardly from said graphite tip to said electrical conducting means.

4,145,565

DEVICE FOR MAINTAINING A SEPARATION BETWEEN TWO ELECTRIC CONDUCTORS

Jerome Donon, Paris, France, assignor to Compagnie General d'Electricite S.A., Paris, France

Filed Jul. 1, 1976, Ser. No. 701,915
Claims priority, application France, Jul. 22, 1975, 75 22866
Int. Cl.[2] H01B 9/04
U.S. Cl. 174—28 7 Claims



1. A device for maintaining the separation between two electric conductors, comprising:

a dielectric spacer disposed between a first bearing zone and a second bearing zone which are mechanically and electrically continuous respectively with said two conductors;

said first and second bearing zones constituting respectively parts of a first conductive surface and second conductive surface which are electrically continuous with said two conductors and which are adjacent to each other so that when a voltage is applied between these conductors a corresponding electric field is set up throughout the whole space between these two conductive surfaces;

at least said first bearing zone being disposed at the bottom of a recess in said first conductive surface, so that this bearing zone is further away from said second conductive surface than the remainder of this first conductive surface, the edges of this recess being connected progressively with the remainder of this first conductive surface by a curved part to form an "embedding" of the spacer in this conductive surface, and said spacer having a high permittivity in the vicinity of said first bearing zone than it has further away from said first bearing zone.

4,145,566

HOUSING FOR ELECTRICAL DEVICES

Bernhard Weingartner, Feldkirch-Tosters, Austria, assignor to Neutrik Aktiengesellschaft, Schaan, Liechtenstein

Filed Oct. 21, 1976, Ser. No. 734,548
Claims priority, application Austria, Oct. 23, 1975, 8112/75
Int. Cl.[2] H01R 13/58
U.S. Cl. 174—65 R 8 Claims

1. In an electrical device, in combination:

(a) a housing having an axis and being formed with an axially elongated bore,

(1) said housing having an external rim portion defining an inlet opening of said bore,

(2) said bore axially tapering toward said inlet opening;

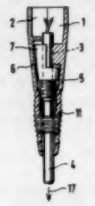
(b) a pressure member received in said bore for movement toward and away from said inlet opening in conforming engagement with said housing;

(c) counter face means in said bore, said pressure member

having an axially extending face radially approaching said counter face means for clamping a cable therebetween during said axial movement of said pressure member toward said inlet opening;

(d) a tubular clamping member substantially coaxial with said bore,

(1) thread means on said clamping member about said axis matingly engaging corresponding threads on said pressure member,



(2) said clamping member carrying abutment means axially engageable with said rim portion for limiting threaded movement of the clamping member inward of said bore,

(3) whereby a cable passing through said tubular clamping member into said bore may be clamped between said face and said counter face means by threadedly moving said clamping member on said pressure member while said abutment means engage said rim portion; and

(e) rib means on said housing in said bore for limiting angular movement of said pressure member about said axis.

4,145,567

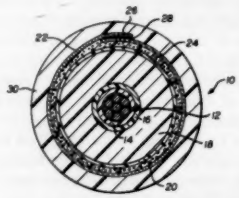
SOLID DIELECTRIC CABLE RESISTANT TO ELECTROCHEMICAL TREES

George Bahder, Edison; George S. Eager, Jr., Upper Montclair, and Carlos Katz, Edison, all of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Jun. 6, 1977, Ser. No. 803,754

Int. Cl.[2] H01B 9/02

U.S. Cl. 174—107 **17 Claims**



1. A power transmission cable for high-voltage, alternating current and resistant to the formation of electrochemical trees, said cable including in combination a core comprising a conductor with strand sealant throughout the length of the conductor in any interstices of the conductor, a semiconducting conductor shield surrounding the conductor and extruded over the conductor, an extruded solid unfoamed polyolefin insulation extruded over the conductor shield, said insulation having the dimension of its radial thickness as great as the diameter of the conductor, a closed cell, compressible, foamed plastic layer surrounding the outside of the core and in contact therewith, a metal shield around the foamed plastic layer and holding the foamed plastic layer under some compression against the core to ensure intimate surface contact between the metal shield and the compressible layer, the metal shield having a seam with the major component of the direction of extent of the seam extending in the direction of the length of the cable, and means for sealing the seam edge portions together to prevent air or liquid from entering the seam, the compressibility of the foam layer being correlated with the seal of the seam of the metal shield to withstand the high coefficient of thermal expansion of the insulation as compared to the lower coefficient of expansion of the metal, and an extruded outer jacket over the other parts of the cable and fitting snugly around the rest of the cable that the outer jacket encloses.

4,145,568

METHOD AND APPARATUS FOR CIPHERING AND DECIPHERING MESSAGES

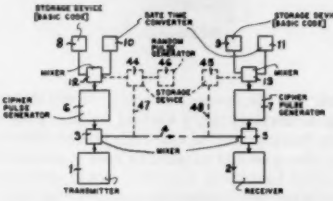
Kurt Ehrat, Zurich, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Oct. 6, 1964, Ser. No. 401,795

Claims priority, application Switzerland, Oct. 18, 1963, 12787/63

Int. Cl.[2] H04L 9/02

U.S. Cl. 178—22 **14 Claims**



1. A method of ciphering and deciphering messages comprising generating a series of cipher pulses, generating a series of basic code pulses, generating a series of additional code pulses representing date and time, mixing the code and date-time pulses to produce a series of pulses for controlling the generation of the cipher pulse, generating a series of pulses representing a message to be transmitted, mixing the cipher pulses with said message pulses and transmitting the ciphered message to a receiving station, generating a series of cipher pulses identical to and in synchronism with the control series of cipher pulses and mixing the identical series of cipher pulses with the ciphered message pulses to decipher the message.

4,145,569

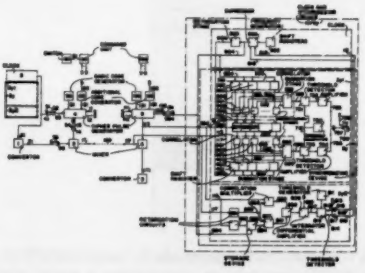
METHOD AND APPARATUS FOR SYNCHRONIZING THE CIPHERING AND DECIPHERING OF BINARY-CODED MESSAGES

Kurt Ehrat, Zurich, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Dec. 22, 1964, Ser. No. 420,393

Int. Cl.[2] H04L 9/02

U.S. Cl. 178—22 **27 Claims**



1. A method of ciphering and deciphering binary coded messages represented by coded series of pulses comprising setting a first pulse generator to an initial condition as defined by a secret basic code and then generating under control of a first clock a first binary coded series of cipher pulses, transmitting a part of the first series of cipher pulses to a receiving

station, generating at the receiving station under control of a second clock a second binary coded series of cipher pulses having a distribution identical with the first series of cipher pulses, changing at the receiving station the part of the first and a corresponding part of the second series of cipher pulses in their relative positions and forming for each of said positions over an interval of several pulses one correlation factor by multiplying together the values of the momentarily opposite simultaneous pulses of the corresponding parts of the first and second series of cipher pulses and summation of the results of said multiplications, step synchronising with this series of correlation factors a further part of the second series of cipher pulses with a corresponding part of the first series of cipher pulses, taking advantage of the criterion that the step synchronism of the parts of the first and second series of cipher pulses gives an optimal value of the correlation factor, generating at the transmitting station clear message pulses representing a message to be transmitted, mixing the clear message pulses with a step synchronised part of the first series of cipher pulses to form an enciphered pulse train, transmitting the enciphered pulse train to the receiving station and mixing at the receiving station the enciphered pulse train with the corresponding step synchronized part of the second series of cipher pulses taking into account any phase deviation between the corresponding step synchronized parts of the first and second series of cipher pulses to decipher the transmitted message.

4,145,570

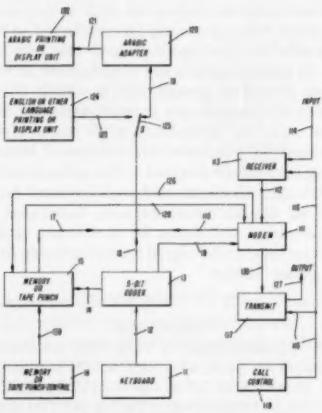
METHOD AND SYSTEM FOR 5-BIT ENCODING OF COMPLETE ARABIC-FARSI LANGUAGES

Khaled M. Diab, P.O. Box 13457, Orlando, Fla. 32809

Filed Oct. 31, 1977, Ser. No. 846,824

Int. Cl.[2] B41J *5/00*; H04L *3/00*

U.S. Cl. 178—30 **9 Claims**



1. A teleprinter system for Arabic-Farsi languages comprising:

means for generating a succession of 5-bit codes each representing an Arabic character of the Arabic-Farsi language or one of a plurality of standard teleprinter characters including teleprinter numerals, punctuation, and command characters, without regard to the form of the Arabic characters;

means for inserting one of at least three 5-bit codes into the succession of 5-bit character codes to identify at least one subsequent character code as being in one of at least three predetermined groups of characters associated with the inserted one of the three 5-bit codes;

means for receiving and storing the 5-bit code for at least two successive characters;

means responsive to the stored 5-bit codes for classifying each received character as one of a plurality of predetermined character types;

means for generating a second code identifying each stored 5-bit code representing an Arabic character as one of four possible Arabic character forms in response to the classified type of the character immediately preceding and immediately following the first stored of the characters;

means for displaying in its proper form and position each Arabic character represented by a stored 5-bit code in response to said second code and the stored 5-bit code, including means for displaying successive characters in the same position in response to an indication from the classifying means that a character to be displayed is of a character type for which the display position is not to change.

4,145,571

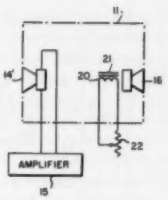
LOUDSPEAKER ENCLOSURE WITH ACOUSTICALLY COUPLED LOUDSPEAKER DAMPER

Thomas L. Cadawas, 92 Oneida Ave., Staten Island, N.Y. 10301

Filed Mar. 13, 1978, Ser. No. 886,057

Int. Cl.[2] H04R *1/28*

U.S. Cl. 179—1 E **2 Claims**



1. A loudspeaker system comprising an enclosure, at least one driven speaker mounted in said enclosure, and a variable acoustical damper mounted in said enclosure, said system being internally sealed so that said speaker and damper are acoustically coupled, said damper comprising a suspended acoustical cone having a high acoustical compliance and an acoustical stiffness significantly less than said driven speaker, and an induction coil and magnetic core, said coil being linked to said cone so as to move over said core in response to oscillations of said cone, said system further comprising variable resistance means connected across said induction coil and operable to selectively vary the induction current generated in said coil upon oscillation of said cone.

4,145,572

POWER SUPPLY CONTROL CIRCUIT FOR SUBSCRIBER CARRIER TELEPHONE SYSTEM

James A. Stewart, Menlo Park, Calif., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Aug. 26, 1977, Ser. No. 828,014

Int. Cl.[2] H04M *19/06*

U.S. Cl. 179—2 BC **28 Claims**

1. Apparatus for selectively disabling the carrier subscriber local battery charging circuit which operates from central office current on the pair of wires of a cable pair, comprising:

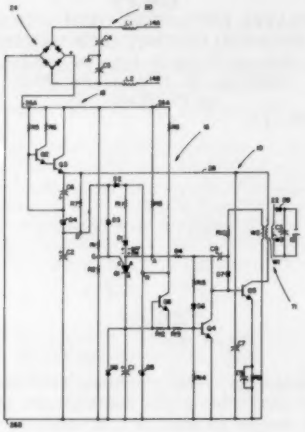
first means which is a switch means having first, second and third terminals, having a negative resistance conduction characteristic, and selectively being in an open state or a closed state between first and third terminals; said first means switching from the open to the closed state for passing current between the first and third terminals when the voltage at the second terminal goes more negative than the voltage at the third terminal by a first prescribed amount, and switching from the closed to the open state when the voltage at the second terminal goes positive with respect to the third terminal by a second prescribed amount, which may be equal to the first prescribed

amount, and the current therethrough falls below a prescribed minimum current value to bias it off;

second means, electrically connected to said cable pair for, producing a voltage across a pair of output terminals of said second means;

third means, which is a capacitive storage means, electrically connected from the first terminal of said first means to both one terminal of said second means and one wire of said pair for storing a charge voltage from said second means during the closed state of said first means;

fourth means electrically connecting said first means second and third terminals to both the other terminal of said second means and the other wire of said pair, said fourth means providing indications of both increasing and high voltages on said pair to said first means third terminal and indications of both decreasing and low voltage conditions on said pair to said first means second terminal;



said first means being responsive to indications of prescribed voltage conditions such as an increasing or constant high voltage on said cable pair which is greater than a first prescribed value for greater than a first prescribed time interval and a decreasing or constant low voltage on said cable pair which is less than a second prescribed value for greater than the first prescribed time interval, said first means under said prescribed conditions closing to pass a current therethrough from said second means to said third means for causing the latter to store a charge voltage, said first means being opened when the line voltage changes sufficiently to bias it off and the current therethrough falls below the prescribed minimum current value; and

fifth means responsive to the charge voltage stored by said third means for holding the charging circuit inoperative for at least a second prescribed time interval.

4,145,573

DIGITAL SATELLITE SYSTEM AND METHOD FOR SERVING USERS OF DIFFERING CAPACITIES

Hamilton W. Arnold, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 13, 1977, Ser. No. 805,711

Int. Cl.[2] H04J *3/06*; H04B *7/15*

U.S. Cl. 179—15 BS **11 Claims**

1. A multibeam digital time-division switched satellite communications system comprising:

a plurality of ground stations each of which transmits an RF signal upon which is modulated an uplink digital bitstream containing data directed to each ground station and each of which receives an RF signal upon which is modulated a downlink digital bitstream containing information directed from each ground station; and

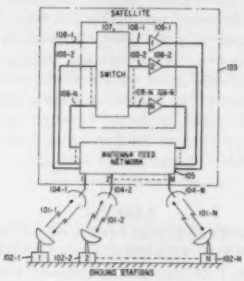
a remote satellite for receiving and transmitting the modulated RF signals from and to each ground station, respectively, said satellite comprising switching means for switching the data in each RF signal transmitted from each ground station to the appropriate RF signal transmitted from said satellite to the ground station to which the data is directed

CHARACTERIZED IN THAT

the capacity of each ground station is quantized into an integral unit;

the bit repetition rate of each uplink and downlink bitstream to and from each ground station is proportional to the quantized capacity of that station;

said satellite further comprises means for demodulating each received RF signal to recover the uplink bitstream transmitted by each ground station, means provided for each ground station for demultiplexing the recovered uplink



bitstream to form a predetermined number of parallel bitstreams at the input to said switching means, said predetermined number of parallel bitstreams being equal to the quantized capacity associated with that ground station, said uplink bitstreams being bit interleaved so that in each set of bits that simultaneously enter said switching means from all ground stations the total number of bits directed to any particular ground station equals the quantized capacity of that particular ground station, for each ground station means for multiplexing at the output of said switching means the predetermined number of bitstreams containing information directed to that ground station to form the downlink bitstream, said predetermined number being equal to the quantized capacity associated with that ground station, and means for modulating each downlink bitstream onto an RF signal for transmission to the associated ground station.

4,145,574

CIRCUIT ARRANGEMENT FOR THE TRANSMISSION OF DIGITAL SIGNALS BETWEEN SUBSCRIBER STATIONS OF A TIME MULTIPLEX TELECOMMUNICATIONS NETWORK

Klaus Wintzer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 27, 1977, Ser. No. 837,297

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1976, 2643687

Int. Cl.[2] H04J *3/00*; H04Q *11/04*

U.S. Cl. 179—15 A **5 Claims**

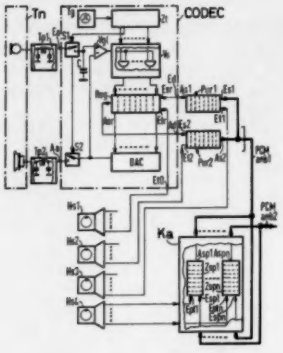
1. A circuit arrangement for the transmission of signals between a subscriber station having an input for receiving analog signals and an output for emitting analog signals and a two-wire multiplex line operated as a four-wire multiplex line in a time division multiplex telecommunications system having a plurality of such subscriber stations and other multiplex lines, comprising:

a coder/decoder arrangement for each subscriber station including a first input connected to the output of the

subscriber station to receive analog signals therefrom, a first output connected to the input of the subscriber station to feed analog signals thereto, a second input for receiving digital signals, a second output for emitting digital signals, conversion means connected to said first and second inputs and to said first and second outputs for converting received analog and digital signals to the opposite type of signals, and a control input for receiving first control pulses to effect an input of digital signals at said second input and an output of digital signals at said output;

a receiving memory for each subscriber station including an input connected to the multiplex line, an output connected to said second input of said coder/decoder arrangement and a control input for receiving second control pulses to effect an input of digital information from the time multiplex line, each of said receiving memories comprising a cyclically triggerable shift register;

a cyclically triggerable shift register transmitting memory for each subscriber station including an input connected to said second output of said coder/decoder arrangement, an output connected to the multiplex line, a control input for



receiving third control pulses to effect transmission of digital information on the multiplex line; and

control circuit means connected to said coder/decoder arrangement control input, to said receiving memory control input and to said transmitting memory control input for providing the first, second and third control pulses thereto, each of said control pulses having a predetermined number of bit pulses corresponding in number to the number of bit pulses forming a digital word in the transmission system, the control pulses time-spaced such that the bit pulses of the first control pulse occur at times which lie in the same pulse time raster defined by the bit pulses of the second and third control pulses assigned to the receiving and transmitting memories, said control means including means for generating respective third control pulses for said transmitting memories including a circulating memory connected to said transmitting memories and storing the addresses thereof, said control circuit comprising means for generating respective second control pulses for said receiving memories including a circulating memory connected to and storing the addresses of said receiving memories.

4,145,575

FREQUENCY-DIVISION MULTIPLEXED SIGNAL TRANSMISSION SYSTEM

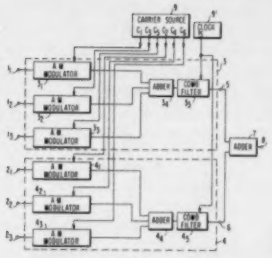
Seiya Shida; Shigeo Fushimi, and Masao Sato, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1977, Ser. No. 843,917

Claims priority, application Japan, Oct. 21, 1976, 51-126735; Apr. 22, 1977, 52-47079

Int. Cl.[2] H04J *1/08*

U.S. Cl. 179—15 FD **9 Claims**



1. A frequency division multiplexed signal transmission system comprising, a plurality of carrier frequency modulators for modulating respective carrier frequencies applied thereto with respective modulating input signals applied thereto, means for applying a respective plurality of carrier frequencies to said plurality of modulators, said carrier frequencies having a predetermined separation frequency therebetween, means for combining the output modulated signals from said plurality of modulators, and comb filter means for suppressing undesired spectra in said combined output signals.

4,145,576

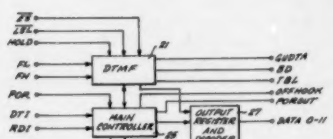
DTMF AND ROTARY DIAL SIGNAL RECEIVER

Frank Twiss, Issaquah, Wash., assignor to Tel-Tone Corporation, Kirkland, Wash.

Filed Jul. 15, 1977, Ser. No. 816,008

Int. Cl.[2] H04M *1/50*

U.S. Cl. 179—16 EC **45 Claims**



1. A dial signal receiver for receiving and decoding DTMF and rotary dial-type digit signals of the type produced by telephones and transmitted on telephone lines, said receiver comprising:

a DTMF subsystem for: (i) receiving the high and low frequency components of a DTMF signal; (ii) determining if the frequency of each of said components is valid by performing independent short and long term frequency checks on each component; and, (iii) if both of said components are found to be valid, producing a DTMF digital code related to the nature of said DTMF signal;

a rotary dial subsystem for: (i) receiving a signal denoting the presence and absence of telephone line loop current; (ii) determining if breaks in loop current, indicated by the absence of loop current, denote a valid rotary dial-type pulse train by measuring loop current intervals, and the

restoration intervals between loop current break intervals; and, (iii) if a pulse train is found to be valid, producing a rotary dial digital code related to the number of pulses forming said pulse train;

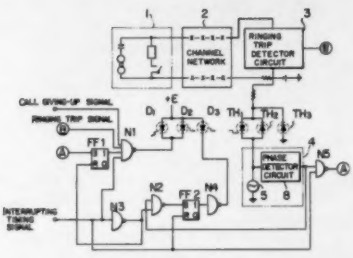
a main controller for receiving external control signals adapted to control the inhibiting of the operation of said DTMF subsystem and said rotary dial subsystem, said main controller connected to said DTMF subsystem and said rotary dial subsystem for inhibiting the operation of said DTMF subsystem and said rotary dial subsystem in accordance with said external control signals; and,

an output register and decoder connected to said DTMF and said rotary dial subsystems for: (i) receiving said DTMF digital codes produced by said DTMF subsystem and said rotary dial digital codes produced by said rotary dial subsystem; and, (ii) producing an output digital code in accordance therewith.

4,145,577
RINGING CONTROL APPARATUS

Takafumi Kojima, Yokohama; Tatsuru Miyoshi, Fujisawa, and Takuji Mukaemachi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 29, 1977, Ser. No. 828,671
Claims priority, application Japan, Aug. 30, 1976, 51-102667
Int. Cl.[2] H04M *3/04*
U.S. Cl. 179—18 HB **8 Claims**



1. A ringing control apparatus for applying a ringing signal to a called subscriber's circuit comprising:

a signal source for generating an AC signal;

a bidirectional switching circuit connected to said signal source for converting said AC signal into an interrupted ringing signal to be delivered to said called subscriber's circuit;

a phase detector circuit connected to said signal source for producing an output signal at a predetermined level of said AC signal; and

a control circuit connected to said phase detector circuit for turning on and off said switching circuit only in synchronism with an applied interrupting timing signal and said output signal of said phase detector circuit.

4,145,578
POSITION ACCESS PREFERENCE METHOD

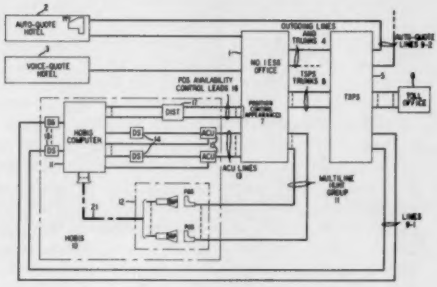
Richard A. Orriss, Granville, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 28, 1978, Ser. No. 900,938
Int. Cl.[2] H04Q *3/64*
U.S. Cl. 179—27 D **11 Claims**

1. In a telephone system (FIG. 1), a method of obtaining preferential access to a plurality of positions (12) for a first type of call, wherein idle available ones of the positions are accessible for calls of the first and a second type and unavailable ones of the positions are accessible for test calls, said method being characterized by the steps of

first, marking a selected available one of the positions unavailable after termination of a call of the second type to the selected position,

second, accessing the selected position for a prescribed number of calls of the first type while it is marked unavailable by overriding the unavailable condition,

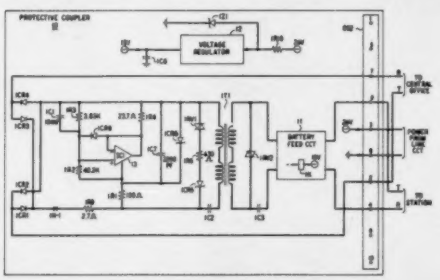


third, marking the selected position available after completion of the prescribed number of calls of the first type to the selected position.

4,145,579
KEY TELEPHONE UNIT PROTECTIVE COUPLER

Ronald J. Angner, Freehold; Wayne J. Egan, Eatontown; Alan M. Gordon, Matawan, and William A. Huryn, Bricktown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 11, 1977, Ser. No. 840,593
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—81 R **5 Claims**



1. A protective coupler circuit for use in a telephone system between the communication leads from a central office and a terminal set, said terminal set operable for varying its signal gain dependent upon the battery potential supplied thereto, said protective coupler comprising,

a first stage connectable to said central office communication leads and a second stage connectable to said terminal set,

a signal frequency transformer interconnecting said stages and having a first set of windings connected to said first stage and a second set of windings connected to said second stage, said windings defining a protective barrier between said stages,

a battery feed circuit connected to said second stage, said battery feed circuit operable for detecting an off-hook condition of said terminal set, for providing battery potential to operate said terminal set, during detected off-hook conditions, and for providing a control signal during said off-hook conditions, said battery potential being of a magnitude to encourage said terminal set to maximally increase said gain,

a current sink circuit connected to said first stage, said cur-

rent sink circuit operable under control of off-hook control signals provided from said battery feed circuit for passing current between said communication leads extended from said central office, said current operable as an indication that the associated station is off-hook, and

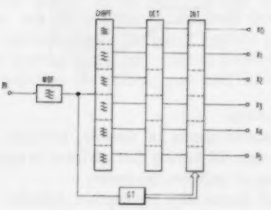
means connected to said first stage for monitoring the DC loop voltage extended from said central office when said current sink is activated for adjusting the gain of signal frequencies passing across said protective barrier in accordance with said monitored DC loop voltage.

4,145,580

MULTI-FREQUENCY SIGNAL RECEIVER

Kouichi Hasegawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 871,711
Claims priority, application Japan, Jan. 24, 1977, 52-6546
Int. Cl.[2] H04Q *1/46*
U.S. Cl. 179—84 VF **5 Claims**



1. A multi-frequency signal receiver adapted to receive an input signal consisting of at least two frequency tones selected out of more-than-two predetermined frequencies, comprising: filter means for receiving said input signal and having mutually independent pass bands at said frequencies; detector means coupled with said filter means for sensing the presence of a signal output at each of said frequencies; a variable threshold circuit coupled to said filter means for detecting the maximum value among the output signals of said filter means and for generating a threshold value for said detector means; an integrator circuit for integrating said input signal means for effecting weighted comparison between the outputs of said variable threshold circuit and said integrator circuit to provide a timing pulse; and means for gating outputs of said detector means by said timing pulse.

4,145,581

AUTOMATIC TELEPHONE DIALER FOR USE IN INTRUSION DETECTION SYSTEMS

Roy Stockdale, Huntington, N.Y., assignor to Napco Security Systems, Inc., Copiague, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,758
Int. Cl.[2] H04M *1/46, 11/04*
U.S. Cl. 179—90 BB **10 Claims**

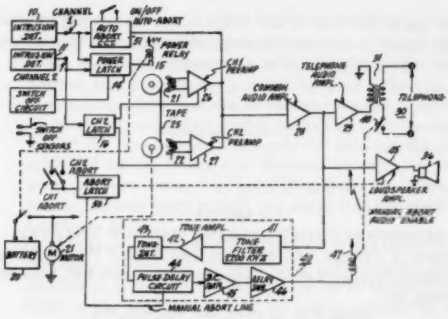
1. In an automatic dialer of the type used to access a telephone line to transmit a prerecorded message via said line to a called location, said called location having a predetermined telephone number manifested by a series of predetermined tone signals of a specified frequency, which signals are stored on a tape associated with said dialer, which tape also contains said prerecorded message, the combination therewith of apparatus for responding to said tone signals to generate dial pulses of a sufficient duration of an on and off time to dial said number via said line to access said called location, comprising:

(a) a controllable element positioned in series with said telephone line and controllable in a first position to close for engaging said line and in a second position to disengage said line,

(b) detection means responsive to said series of tone signals for providing a pulse output indicative of the format of the tone signals stored on said tape,

(c) a multivibrator having at least a first output and a clock input adapted to receive a pulse for changing the output condition of said multivibrator, said multivibrator operative in a first mode wherein said first output is high (SWITCH-ON) and operative in a second mode (SWITCH-OFF) wherein said first output is low, a data input associated with said multivibrator and operative to cause said output to assume a high or a low condition upon receipt of a clock pulse at said clock input, wherein said output will assume either said high or low condition according to the level impressed upon said data input as being high or low,

(d) means coupling said output of said detector means to said data input of said multivibrator,



(e) timing means having one input coupled to said data input of said multivibrator and a second input coupled to said output of said multivibrator, said timing means operative to provide a predetermined delayed signal at an output when said data input signal is different from said output signal of said multivibrator, to provide a pulse at an output of said timing means,

(f) means coupling said output of said timing means to the clock input of said multivibrator for applying said pulse to said clock input of said multivibrator to cause said output of said multivibrator to assume the level present at said data input, and

(g) means coupling said output of said multivibrator to said controllable element to operate the same alternatively in said first and second positions according to said timing means and said tone bursts as detected to thereby provide said dialing pulses to said telephone line at a predetermined on and off ratio.

4,145,582

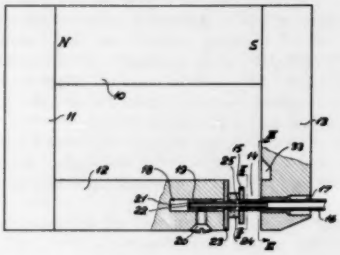
MOVING COIL PICKUP HAVING A SUBSTANTIALLY SQUARE MAGNETIC ARMATURE MOUNTED IN AN AIR GAP ADJACENT A SQUARE FACE MAGNETIC MEMBER

Hisayoshi Nakatsuka, Greve Strand, Denmark, assignor to Ortofon Manufacturing A/S, Valby, Denmark

Filed Apr. 12, 1976, Ser. No. 676,350
Claims priority, application Japan, Apr. 15, 1975, 50-44888
Int. Cl.[2] H04R *9/16*
U.S. Cl. 179—100.41 K **2 Claims**

1. A pickup comprising a relatively flat magnetic armature having substantially square parallel side faces, at least one coil wound upon said magnetic armature, a pair of magnetic members of a magnetic circuit, one of said magnetic members comprising a cylindrical pole piece having a free end portion with a substantially square face, each of said magnetic members having a face, the faces of said magnetic members positioned substantially parallel to each other and spaced apart to define an air gap, means for positioning said magnetic armature in said

air gap so that the side faces of said magnetic armature are substantially parallel to the faces of said magnetic members, at



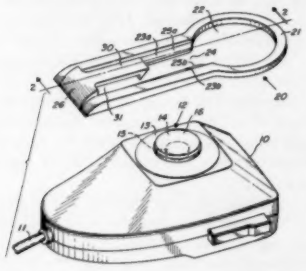
least one of the faces of said magnetic members being substantially square in cross section and in alignment with the substantially square side face of said magnetic armature.

4,145,583

REMOVABLE MICROPHONE HANGUP ADAPTER

Thomas J. Oshgan, Mt. Prospect, and Ronald W. Polomsky, Schaumburg, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Aug. 8, 1977, Ser. No. 822,976
Int. Cl.[2] H04M *1/06*
U.S. Cl. 179—146 R **5 Claims**



1. A removable adapter member for hanging a microphone, from any suitable projection, the microphone having a microphone hangup button extending outwardly therefrom, said hangup button having undercut sides with grooves therein forming a top portion, the adapter member comprising:

a loop member having a central aperture therein permitting the hook member to be hung from any suitable projection;

two parallel spaced-apart rail members extending from the loop member, said rails forming a channel therebetween and each rail having an inwardly extending portion for engaging the grooves in the undercut sides of the microphone hangup button with the microphone hangup button grooves slideably engaging the inwardly extending rail portions;

an end member perpendicular to and extending from the ends of the rail members opposite the loop member, said end member providing a stop for the top end of the microphone hangup button;

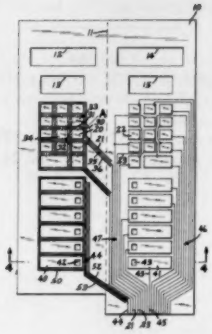
a resilient member extending from the end portion over the channel for snap-fit engaging the top end of the microphone hangup button.

4,145,584

FLEXIBLE KEYBOARD SWITCH WITH INTEGRAL SPACER PROTRUSIONS

Jon L. Otterlei, 4704 Merilane, Edina, Minn. 55436

Continuation-in-part of Ser. No. 681,069, Apr. 28, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,759
Int. Cl.[2] H01H *9/00, 13/02*
U.S. Cl. 200—5 A **15 Claims**



1. In combination:

a pair of smooth sheets of flexible, resilient, electrically insulating material having first surfaces in apposition, said sheets being of uniform thickness;

a first area of electrically conductive material on said first surface of one of said sheets;

a second area of electrically conductive material on the first surface of the other sheet in apposition with said first area;

means independently making electrical connection with said areas;

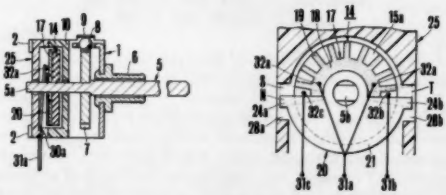
and a raised ridge embossed in one of said sheets substantially surrounding one of said areas closely enough to normally prevent contact between said areas in the absence of pressure applied externally to the sheets within the outline of said areas, the height of said ridge being of the same order of magnitude as the thickness of the sheet.

4,145,585

ROTARY PULSE SWITCH

Sadayoshi Iwasaki, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 24, 1977, Ser. No. 827,346
Claims priority, application Japan, Aug. 24, 1976, 51-100813
Int. Cl.[2] H01H *19/54*
U.S. Cl. 200—11 DA **2 Claims**



1. A rotary switch comprising:

a case;

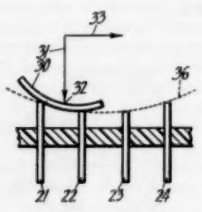
a turn shaft mounted within said case;
an insulating disc fixed centrally to said shaft and having a conductor portion on one surface thereof;
said conductor portion comprising a ring-shaped common portion and a plurality of rotary contact portions extending radially from said common portion and spaced equally apart;
a pair of fixed contact elements disposed symmetrically about said turn shaft and each having a contact portion slidably engageable with said rotary contact portions;
another fixed contact element having a contact portion slidably engaging said common portion;
an insulating plate interposed between the conductor portion on said disc and said contact elements;
said plate being mounted normally for rotation with said shaft yet slidable thereon and having stopper portions extending outwardly from opposite locations on said plate and adapted to abut portions of said case so as to limit rotation of said plate through a limited arc;
whereby upon the rotation of said shaft in either direction, one of the contact portions of said pair of fixed contact elements will be electrically isolated from said rotary contact portion while the other contact portion of said pair will contact said rotary contact portion as said rotary contact portions are rotated past said other contact portion.

4,145,586

ELECTRIC SWITCHES

David A. Swann, 17-21 Carinish Rd., Clayton, Victoria, 3168, Australia

Continuation of Ser. No. 634,177, Nov. 21, 1975, abandoned.
This application Dec. 20, 1976, Ser. No. 752,284
Claims priority, application Australia, Nov. 25, 1974, PB 9740; Dec. 3, 1974, PB 9857
Int. Cl.[2] H01H *9/18*
U.S. Cl. 200—67 G **27 Claims**



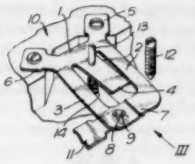
1. An electric switch having a mechanism comprising a contact bridging member, two spaced apart contacts having surfaces adapted to be contacted by said member; said surfaces lying on a surface and said contacts adjacent said surfaces lying on one side of said surface, wherein said member has portions which, in said one position, are inclined to said surface and away therefrom towards the other side thereof and each of which portions mechanically and electrically contacts a respective one of said contacts and wherein an intermediate portion of said member, in said one position lies to said one side of said surface; means biasing said member, at said intermediate portion, to lie on said one side of said surface, and an actuator adapted to slide said member relative to said contacts; and constructed and arranged such that said member is slideable with respect to said contacts by said actuator from said one position and in so sliding to move said intermediate portion towards said surface against said biasing means tending to resist such movement.

4,145,587

SNAP ACTION SWITCHES

Robert F. Purssell, Plymouth, England, assignor to Ranco Incorporated, Columbus, Ohio

Filed Jul. 25, 1977, Ser. No. 818,381
Int. Cl.[2] H01H *21/04*
U.S. Cl. 200—67 DA **14 Claims**



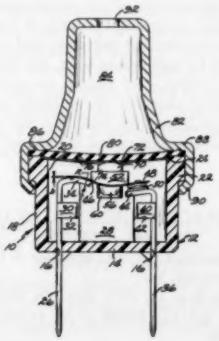
1. A snap action switch blade comprising:
a single piece of resilient sheet metal formed with a base portion, two longitudinally extending arms projecting in one direction from one side of the base portion, a central longitudinally extending tongue projecting from the same side of the base portion symmetrically between the two arms and having a free end disposed between the two arms, and two fixing lugs projecting from the opposite side of the base portion each lug supporting the blade in cantilever fashion;
means interconnecting the ends of the two arms remote from the base portion and to predispose the blade for snap movement in response to the application of an operating force to the tongue, and a single contact carried at the ends of the arms remote from the base portion and located in a position spaced from the longitudinal axis of symmetry of the blade which passes through the tongue.

4,145,588

CONDITION RESPONSIVE APPARATUS HAVING FREELY DISPOSED DISC

John W. Orcutt, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 29, 1977, Ser. No. 837,971
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—83 P **10 Claims**



1. A pressure responsive device comprising a base member having a top end portion, a flat surface area portion formed on the top end portion, a recessed disc seat formed in the flat surface area portion, a snap acting pressure responsive calibrated disc loosely received in the disc seat, the disc movable from a first configuration to a second configuration and back upon being subjected to selected pressure levels, cap means having a pressure receiving orifice therein to facilitate connection to a pressure source received over the top end portion and

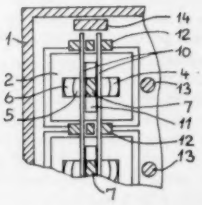
sealingly attached to the base member and a gasket formed of a sheet of flexible material interposed between the cap on one side thereof and the disc and flat surface area portion on the other side thereof, the cap applying a sealing force to the base through the gasket and flat surface area portion, a groove is formed in at least one of the flat surface area portion and the cap overlying the flat surface area portion whereby the gasket is forced into the space within the groove when the cap is attached to the base member, the cap configured so that it is spaced from that portion of the gasket overlying the disc, a switch cavity is formed in the base member and switch means mounted in the switch cavity and operatively connected to the disc, the switch means adapted to close a circuit when the disc is in the first configuration and open the circuit when the disc is in the second configuration.

4,145,589

PUSHBUTTON ARRANGEMENT

Kaj Albrechtsen, Virum, Denmark, assignor to GNT Automatic A/S, Solborg, Denmark

Filed Jun. 28, 1977, Ser. No. 810,725
Claims priority, application Denmark, Jun. 30, 1976, 2949/76
Int. Cl.[2] H01H *13/28*
U.S. Cl. 200—159 R **14 Claims**



1. A pushbutton arrangement comprising a pushbutton and a spring member, said pushbutton comprising an upper part operable by finger touch and a lower part engaged by said spring member and serving to operate an activating member such as an electrical contact, said spring member comprising at least one substantially straight spring wire engaging a downwardly and inwardly slanting surface of said lower part of said pushbutton, said slanting surface comprising at least two slanting surface portions having different angles of inclination to the direction of movement of the pushbutton, the change of angle of inclination occurring abruptly at the place of transition between the two surface portions, said surface being successively engaged by said spring wire, the surface portion last engaged by the spring wire having an angle of inclination substantially smaller than the immediately preceding surface portion, but still sufficient for initiating the restoration of the pushbutton by the engagement of the spring wire.

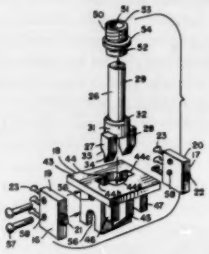
4,145,590

ACTUATION FOR SEQUENTIALLY OPERATING PLURAL SWITCHES

Thomas J. Repplinger, Cary, Ill., assignor to Otto Engineering, Inc., Carpentersville, Ill.

Filed Sep. 15, 1977, Ser. No. 833,457
Int. Cl.[2] H01H *3/20, 41/00*
U.S. Cl. 200—330 **8 Claims**

1. An electrical switch apparatus comprising
a frame,
at least a pair of electrical switches mounted on the frame, each of the switches having a pushbutton movable between a first position and a second position,
an actuator reciprocably mounted on the frame for reciprocation between a first position, at least one intermediate position, and a third position, the actuator including at least a pair of cam surfaces which are spaced apart in a direction extending generally perpendicularly to the direction of reciprocation of the actuator, each of the cam surfaces being engageable with the pushbutton of one of the electrical switches for moving the pushbutton from its first to its second position as the actuator moves from its first position to its third position, the cam surfaces being constructed and arranged so that the pushbuttons of both of the switches will be in their first positions when the actuator is in its first position, one of the cam surfaces



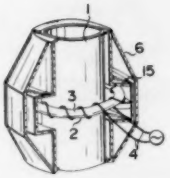
being engageable with the pushbutton of one of the switches to move the pushbutton to its second position when the actuator is in its intermediate position, the other cam surface being engageable with the pushbutton of the other switch to move the pushbutton to its second position when the actuator is in its third position whereby the two switches are actuated sequentially as the actuator moves from its first position to its third position.

4,145,591

INDUCTION HEATING APPARATUS WITH LEAKAGE FLUX REDUCING MEANS

Tukasa Takeda, Yokohama, Japan, assignor to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1977, Ser. No. 756,256
Claims priority, application Japan, Jan. 24, 1976, 51-6150[U]; Jul. 9, 1976, 51-90558[U]
Int. Cl.[2] H05B *5/08*
U.S. Cl. 219—10.49 R **12 Claims**



1. An induction heating apparatus, which comprises:
a hollow heating element for accommodating the material-to-be heated therein, said heating element being made of a metallic material;
a ring for generating magnetic flux disposed surrounding said heating element and composed of a ring core and an electric conductive wire wound round said ring core to form a toroidal coil electrically insulated from the ring core;
a nonferrous, highly electrically conductive, copperlike shell disposed outside the heating element and magnetic flux generating ring and having the ends thereof electrically connected with the two ends of a desired heat generating portion of the heating element, wherein said copperlike shell substantially covers the circumference of said heating element and magnetic flux generating ring, said copperlike shell being formed in a cylindrical shape capa-

ble of accommodating said heating element and magnetic flux generating ring therein; and

a cylindrical member made of ferromagnetic material, said cylindrical member being disposed outside said heating element, magnetic flux generating ring and copperlike shell so as to cover them and having the ends thereof electrically connected with at least one of (1) said two ends of said desired heat generating portion of said heating element and (2) the ends of said copperlike shell.

4,145,592

INDUCTION HEATING APPARATUS WITH MEANS FOR DETECTING ZERO CROSSING POINT OF HIGH-FREQUENCY OSCILLATION TO DETERMINE TRIGGERING TIME

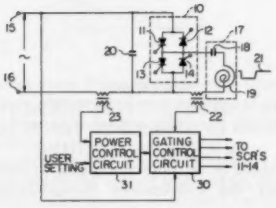
Takumi Mizukawa; Keizo Amagami; Mitsuyuki Kiuchi; Hirokazu Yoshida, and Tatsuo Saka, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 10, 1976, Ser. No. 749,258

Claims priority, application Japan, Jan. 14, 1976, 51/3500

Int. Cl.[2] H05B *5/04*

U.S. Cl. 219—10.49 R **9 Claims**



1. An induction heating cooking apparatus including solid state switching devices interposed between a source of low frequency power and a load circuit, and a control circuit for triggering said switching devices to generate power of high frequency oscillation in said load circuit to produce heat in an inductive cooking ware by electromagnetic induction, said control circuit comprising: a zero crossing detector for detecting a zero crossover point of said high frequency oscillation, means for developing a first signal representative of power delivered to said cooking ware, means for establishing a setting level to represent a desired power level, comparator means for developing a second signal representative of the deviation of said first signal from said setting level, and mans for determining the interval between successive triggering actions of said switching devices in accordance with the magnitude of said second signal to control the amount of power delivered to said cooking ware at said desired power level.

4,145,593

AUTOMATIC PIPE WELDING SYSTEM

George J. Merrick, Franklin; George E. Cook, Brentwood, and Donald D. Modglin, Nashville, all of Tenn., assignors to Merrick Welding International, Inc., Nashville, Tenn.

Filed Feb. 3, 1976, Ser. No. 654,975

Int. Cl.[2] B23K *9/12*

U.S. Cl. 219—60 A **8 Claims**

1. Apparatus for welding a circumferential joint about a length of pipe, comprising:

guide means supported by the pipe and defining a fixed path of movement in proximately parallel relation to a circumferential joint to be welded;

carriage means mounted on said guide means and operative for movement along said fixed path;

at least one torch support means carried by said carriage means and supporting a welding torch in welding relation to the pipe joint;

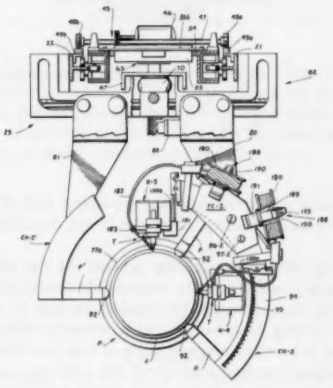
said torch support means being selectably operative independently of said carriage means to vary a selected distance between said welding torch and the circumferential pipe joint;

means responsive to a predetermined welding parameter to provide a parameter responsive signal;

means responsive to the location of said carriage means on said fixed path to provide a carriage location signal corresponding to said carriage location;

command means operative to receive and retain selectably variable parameter command signals that correspond to certain locations of said carriage along said fixed path, and further operative in response to said carriage location signals from said location responsive means to provide said parameter command signals which correspond to the actual location of said carriage;

said torch support means being responsive to said parameter responsive signal and to said parameter command signal to



adjust said selected distance so that parameter responsive signal maintains a predetermined relation to said parameter command signal;

said torch support means receiving a welding torch including a filler wire feed appartus with filler wire variable drive means;

means operative to supply a selectably variable amount of heating current to said filler wire at said welding torch;

first control means responsive to said parameter command signal from said command means to adjust said heating current in response to a first predetermined selectably variable function of said carriage location; and second control means responsive to said parameter command signal from said command means to adjust the rate at which filler wire is supplied by said filler wire drive means in response to a second predetermined selectably variable function of said carriage location.

4,145,594

METHOD FOR LONGITUDINALLY SEAM-WELDING PIPE-BLAND FOR WELDED STEEL PIPE FROM INSIDE ALONG GROOVE

Fusao Koshiga, Kawasaki; Jinkichi Tanaka; Itaru Watanabe; Motoaki Suzuki, all of Yokohama, and Toshihiro Takamura, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1977, Ser. No. 799,986

Claims priority, application Japan, Jun. 22, 1976, 51-72779

Int. Cl.[2] B23K *09/12*

U.S. Cl. 219—61 **3 Claims**

1. In a welding method for longitudinally seam-welding a pipe-blank from the inside thereof using the metal arc welding process comprising supplying direct electric current as the welding current to a plurality of consumable electrodes in tandem through at least one cable, feeding said respective consumble electrodes through a respective plurality of weld-

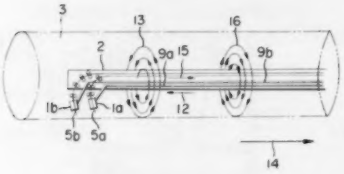
ing torches in tandem, while moving a boom carrying said welding torches through said pipe-blank relative to said pipe-blank in the same direction as that of welding, said boom having a free end which carries said welding torches and having a length at least equal to that of said pipe-blank,

the improvement comprising:

providing at least two consumable electrodes, said electrodes being provided in an even number;

connecting half of said at least two consumable electrodes to a source of power so as to be positive in polarity and arranging said half of said electrodes as the leading electrodes in the direction of welding;

connecting the remaining half of said at least two consumable electrodes to a source of power so as to be negative in



polarity, and arranging said remaining half of said electrodes as the trailing electrodes in the direction of welding;

applying the GMA welding process on the side of said leading positive polarity consumable electrodes; and

applying the submerged-arc welding process on the side of said trailing negative polarity consumable electrodes;

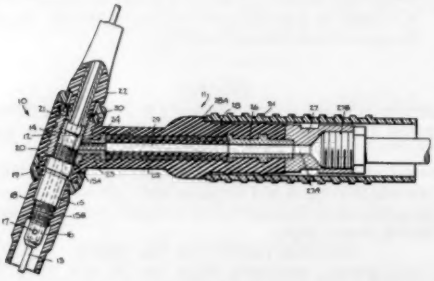
thereby preventing magnetization of said pipe-blank and the resulting magnetic arc blow of the welding arc by causing lines of magnetic force produced by said direct electric current for welding flowing through said at least one cable introduced into said pipe-blank to cancel each other, and also preventing spattering of molten droplets from said negative polarity consumable electrodes.

4,145,595

GAS SHIELDED ARC-WELDING TORCH

Klaus Keller, Nissequoque, and Erich Keller, Smithtown, both of N.Y., assignors to Welding Nozzle Incorporated, Farmingdale, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,181
Int. Cl.[2] B23K *9/16*
U.S. Cl. 219—75 **6 Claims**



1. A gas-shielded arc welding torch provided with a holder section having a barrel adapted to retain a tungsten electrode rod, and a handle section which supplies electric current to the rod through the barrel as well as an inert gas to the region surrounding the exposed end of the rod, the holder section being bendable relative to the handle section, said handle section comprising:

(A) a helix formed of a highly-conductive metal and having front and rear terminals;

(B) a tubular metal coupler attached at one end to said barrel, said coupler extending laterally from the barrel and communicating therewith, the other end of the coupler being connected to the front terminal of the helix whose rear terminal is connected to one end of a metal pipe;

(C) a hollow electrical connector attached to the other end of the pipe to define a current-supply line extending from the connector to the barrel whereby current from a welding-current source may be supplied to the rod retained by the barrel by a cable coupled to the connector; and

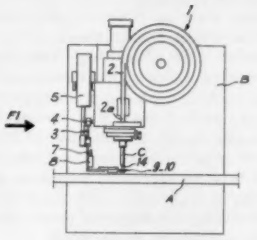
(D) a body of elastomeric material molded about said coupler, said helix and said pipe, the convolutions of said helix being spread apart to admit said material, whereby said helix is embedded in said body, said body having a central bore therein passing through the helix and joining the pipe to the coupler to define a gas supply conduit extending from the hollow connector into the interior of the barrel, the front portion of the body which surrounds the corresponding portion of the helix forming therewith a flexible neck which permits bending thereof.

4,145,596

METHOD AND DEVICE FOR THE AUTOMATIC INTRODUCTION OF STUDS INTO THE ELECTRODE OF A WELDING MACHINE

Edmond L. Pignal, Sciez, France, assignor to Societe Anonyme dite: Societe des Fabrications Biraghi-Entrepose, Paris, France

Filed Oct. 4, 1976, Ser. No. 729,410
Claims priority, application France, Oct. 8, 1975, 75 30837
Int. Cl.[2] B23K *9/20, 9/12*
U.S. Cl. 219—98 **2 Claims**



1. Apparatus for successively automatically feeding a horizontal hollow electrode of a stud welding machine having a frame that supports said electrode with a plurality of elongated cylindrical studs, said apparatus comprising:

a vertical stud feeding slide fixed to said frame above said electrode to successively position said studs for transfer to said electrode;

an arm pivotally mounted on said frame for movement about a horizontal axis located at the intersection of vertical projection of a stud positoned in said slide and the horizontal axis of said electrode;

a jack for controlling the rotation of said arm;

a finger slidably mounted at the end of said arm with respect to said electrode;

a second jack carried by said arm coupled to said finger in order to extend and retract said finger with respect to said arm; and

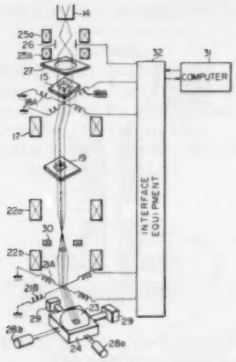
a gripper mounted on said slidable finger and having two jaws movable towards and away from a stud to be fed into said electrode.

4,145,597

ELECTRON BEAM LITHOGRAPHIC SYSTEM

Hiroshi Yasuda, Tokyo, Japan, assignor to Fujitsu Limited, Japan

Filed Dec. 21, 1976, Ser. No. 752,989
Claims priority, application Japan, Dec. 31, 1975, 50-158501
Int. Cl.[2] B23K *15/00*
U.S. Cl. 219—121 EB 10 Claims



1. An electron beam lithograph system for exposing by an electron beam an electron beam resist formed on a semi-conductor substrate so as to form a pattern on said electron beam resist, comprising:

a first silicon plate having a rectangular slit which gives to an electron beam the area of said rectangular slit;

a second silicon plate having an opening having a rectangular corner, said rectangular slit and corner respectively of said first and second silicon plates being formed by cutting a silicon crystal along the (100) plane of said silicon crystal and by selectively etching said silicon crystal so as to expose the (111) plane of said silicon crystal;

a first deflection means provided between said first and second silicon plates for deflecting said electron beam which has passed said first silicon plate so as to control the amount of overlapping between the area of said electron beam which has passed said first silicon plate and said opening of said second silicon plate, and;

a second deflection means provided after said second silicon plate for deflecting the electron beam which has passed said second silicon plate so as to expose it at a predetermined coordinate of said semiconductor substrate on said electron beam resist.

4,145,598

AUTOMATIC ARC WELDING PROCESS USING A CONSUMABLE NOZZLE

Katsuro Iio, and Akiyoshi Osato, both of Kamakura, Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Division of Ser. No. 552,606, Feb. 24, 1975, Pat. No. 4,045,648, which is a continuation of Ser. No. 376,367, Jul. 5, 1973, abandoned. This application May 24, 1977, Ser. No. 800,077
Claims priority, application Japan, Jul. 4, 1972, 47-66948; Oct. 20, 1972, 47-105653
The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.
Int. Cl.[2] B23K *25/00*
U.S. Cl. 219—137 R 10 Claims

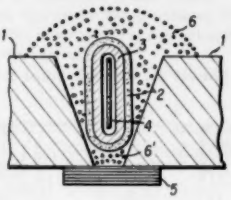
1. An automatic arc welding process for butt welding together two horizontally disposed base materials with the welding line in a horizontal plane, characterized in that said process comprises the steps of:

placing a backing material on the backside of the welding line;

placing a longitudinal horizontally disposed consumable nozzle, which is coated with an insulating material disposed therearound and has a hollow core portion, along a horizontal welding line between said base materials,

placing powder flux on said consumable nozzle to form a shield from outer atmosphere,

continuously feeding a horizontally disposed welding wire through said hollow core portion at a rate faster than said nozzle is being consumed; and



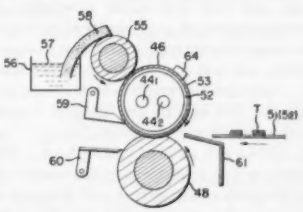
generating arcs from both the consumable nozzle and the continuously moving welding wire to achieve deep penetration and to prevent the forward flow of the molten metal toward the nozzle enabling the formation of a large amount of deeply penetrated deposited metal.

4,145,599

FIXING DEVICE OF ELECTROPHOTOGRAPHIC COPYING MACHINE

Masaaki Sakurai, Hanno, and Masato Ishida, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,811
Claims priority, application Japan, Apr. 19, 1976, 51-44775
Int. Cl.[2] G03G *15/20*
U.S. Cl. 219—216 9 Claims



1. A fixing device for a copying machine, comprising:

a heating member adapted to be contacted with a member bearing an image to be fixed;

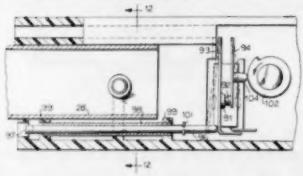
a heating source, supplied with electric power, for heating said heating member; and

control means for allowing electric power supply to said heating source to heat said heating member, wherein said control means stops the electric power supply when the heating member is heated to a first fixing temperature, allows resumption of the electric power supply a predetermined time after stopping the electric power supply in order to maintain the temperature of said heating member at a second fixing temperature higher than said first fixing temperature and maintains the temperature of the heating member at a third fixing temperature higher than said second fixing temperature when said copying machine is operated to provide a copy.

4,145,600
DEVICE FOR TREATING HAIR WITH HEAT AND VAPOR

Henry J. Walter, Wilton, and Raymond W. Kunz, Monroe, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Division of Ser. No. 572,098, Apr. 28, 1975, Pat. No. 4,034,201.
This application Apr. 18, 1977, Ser. No. 788,432
Int. Cl.[2] H05B *1/02;* A45D *1/04, 2/36*
U.S. Cl. 219—222 3 Claims



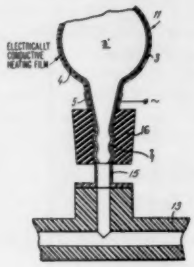
1. A hair treating device comprising:
a tubular barrel having first and second ends, a predetermined cross-sectional configuration and aperture means therethrough;
a handle portion extending from the first end of the tubular barrel;
heat and vapor generating means registering with said barrel for generating heat in said barrel and vapor for passage through said aperture means;
a removable mandrel means for winding hair therearound removably received over said tubular barrel in an operative position thereon, said mandrel means being generally tubular in configuration and having a longitudinal axis, first and second ends, and inner and outer surfaces; and
vapor passage means extending through said inner and outer surfaces, said heat and vapor generating means being electrically energized; said handle including an electrical switch means for energizing said heat and vapor generating means; and said electrical switch means having safety means connected therewith which is engaged and operated by the first end of the mandrel means when said mandrel means is operatively positioned on said barrel to permit said switch means to energize the heat and vapor generating means, said safety means rendering said switch means incapable of energizing said heat and vapor generating means when said mandrel means is not operatively positioned on said barrel.

4,145,601
ELECTRIC HEATING INSTALLATION FOR HEATING HIGH PURITY LIQUID AND GASEOUS MEDIA

Konstantin A. Lavrentiev, ulitsa F. Engelsa, 42, kv. 43; Gennady P. Popov, Leninsky prospekt, 161, kv. 8; Ivan G. Popov, Leninsky prospekt, 148, kv. 27, all of Voronezh; Valentin I. Boroda, ulitsa Mira, 50, kv. 26, and Vladimir N. Melnichuk, Borodinsky proezd, 14, kv. 49, both of Klin Moskovskoi Oblasti, all of U.S.S.R.

Filed Oct. 18, 1976, Ser. No. 733,371
Int. Cl.[2] F24H *1/12;* H05B *3/00, 3/16*
U.S. Cl. 219—298 8 Claims

1. An installation for heating liquid and gaseous media comprising:
a casing;
at least one fluid heating unit accommodated inside of said casing, each fluid heating unit comprising
an insulating body made of a plurality of variable-section containers connected in series by necks, said insulating body having an interior chamber through which a medium to be heated flows;
a heat radiating conducting film applied to an external surface of at least the containers of said body of each of said fluid heating units;

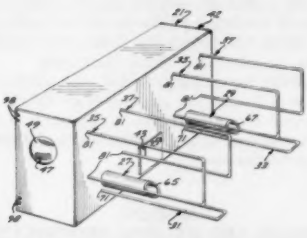


buses, for delivering electric voltage to said conducting film, connected to said conducting film;
inlet and outlet pipe unions connected to said interior chamber of said insulating body of each of said at least one heating unit; and
a system for supplying and discharging said medium connected with the inlet and outlet pipe unions.

4,145,602
SKI BOOT AND GLOVE WARMER

Richard D. Lee, 24891 Woodside La., El Toro, Calif. 92630

Filed Nov. 9, 1977, Ser. No. 850,063
Int. Cl.[2] F26B *23/10*
U.S. Cl. 219—370 9 Claims



1. A ski boot and glove warmer comprising:
a vertically extending body;
a pair of horizontal transversely spaced apart air tubes mounted on said body and projecting parallelly in one direction therefrom to terminate in hot air nozzles;
a pair of boot supports projecting horizontally from said body beneath said respective tubes for receiving the backs of six boots thereon when said boots are positioned with said tubes inserted in said boots;
two pairs of guide rails disposed on respective opposite sides of said tubes, above said respective supports, for receipt therebetween of said boots to hold said boots with the toes projecting upwardly;
blower means mounted in said body and including an electric drive motor;
duct means leading from said blower means to said respective tubes;
electric heater means in said duct means for heating air directed to said ducts; and

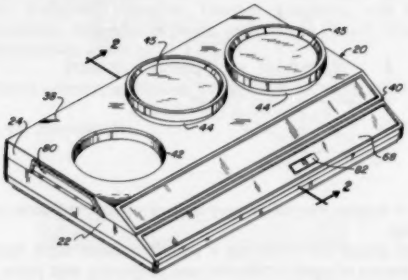
coin actuated control means connected with said electric drive motor and heater means and including means responsive to insertion of a preselected denomination of currency to render said electric motor and heater operative for a predetermined period of time whereby a pair of cold or damp ski boots may be telescoped over said tubes positioned on said supports and held with the toes up by said guide rails and said predetermined denomination of currency inserted to blow air over said heater means to be heated and exhausted into said support boots.

4,145,603

FOOD SERVING SYSTEM

Frederick G. Mackay, Tarzana, Calif.; Horace T. Keryluk, and Thomas G. Cannon, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed May 9, 1977, Ser. No. 795,175
Int. Cl.[2] H05B *3/68*
U.S. Cl. 219—387 **10 Claims**



1. A warming unit and serving tray combination comprising:
a warming unit having a generally planar bottom surface accommodating resting of said unit on a counter top, a flat and electrically insulative but heat conductive top surface parallel to and spaced above said bottom surface, means affixed to the underside of said top surface for warming said top surface, and means, including means for securing said top surface in position with respect to said bottom surface, for defining a peripheral margin of uniform predetermined vertical cross-sectional contour and extending around the entire periphery of said top surface;
a non-metallic serving tray having a generally planar upper surface corresponding in extent to said top surface of said warming unit and having a peripheral and downwardly depending skirt means the bottom margin of which has a contour matable with the outer edge portion of said predetermined contour on all sides of said periphery and means matable with respect to said peripheral margin for nesting said serving tray directly on said top surface of said warming unit;
means defining a plurality of openings in said upper surface of said serving tray;
and a plurality of food containers individually seatable in respective different ones of said openings.

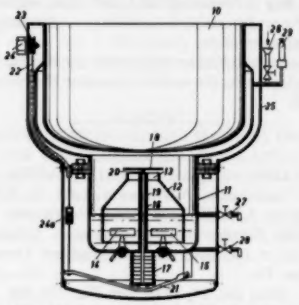
4,145,604

AUTOMATICALLY CONTROLLED ELECTRIC STEAM COOKING PAN

Richard Carlsson, Gothenburg, Sweden, assignor to AB Platslageriet Rostfri, Gothenburg, Sweden

Filed Sep. 6, 1977, Ser. No. 830,836
Claims priority, application Sweden, Sep. 8, 1976, 7609892
Int. Cl.[2] A47J *27/06;* **H05B** *3/60*
U.S. Cl. 219—439 **4 Claims**

1. A steam-heated cooking pan comprising in combination a double-mantled food preparation vessel arranged above a steam generator, said steam generator comprising:
an outer vessel;
an inner vessel enclosed in said outer vessel, said inner and outer vessels being in communication with the space between the walls of said double-mantled food preparation vessel, said inner vessel being open at its bottom and being provided with a steam exhaust opening at its top, said open bottom of the inner vessel being spaced from the bottom of the outer vessel;
a pressure sensitive member below said outer vessel, said outer vessel, the space between the wall of said double mantled food preparation vessel and said pressure-sensitive member all forming a sealed space;
a pair of spaced electrodes for generating steam being disposed within the inner vessel at a position intermediate the top and bottom thereof;
a movable cover being disposed for closing the opening at



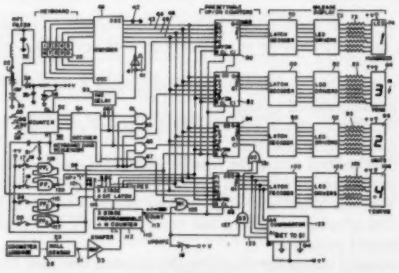
the top of the inner vessel at a predetermined pressure, said cover being acted upon by said pressure-sensitive member;
a tube arranged to extend from the pressure-sensitive member through the bottom of said outer vessel and to the opening at the top of said inner vessel, said tube permitting communication between said pressure-sensitive member and said inner vessel; and
a rod operatively interconnecting said pressure-sensitive member and said cover, said rod extending through said tube.

4,145,605

VEHICLE POSITION INDICATOR

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Apr. 11, 1977, Ser. No. 786,293
Int. Cl.[2] G06F *15/20;* **G06M** *3/14*
U.S. Cl. 235—92 DN **22 Claims**



1. A vehicle position indicator for indicating a vehicle's position with respect to predetermined reference locations comprising:
a source providing electrical pulses representative of the distance being traveled by a vehicle;
operator programmable calibration circuit means comprising a programmable divide-by-N counter coupled to said source for dividing pulses therefrom by a divisor comprising a calibration number N to calibrate the system to assure the displayed vehicle position accurately corresponds to the vehicle's actual position, said divide-by-N

counter providing output signals accurately representing vehicle travel and circuit means actuatable by the vehicle's operator for programming said divide-by-N counter with a calibration number N;

means for storing information representative of a predetermined location and coupled to said calibration circuit means for receiving output signals therefrom for providing information representative of the vehicle position with respect to the predetermined location as the vehicle moves toward or away from the predetermined location;

a digital keyboard and means for selectively coupling said keyboard to said calibration circuit means for insertion of the calibration number N into said divide-by-N counter and for selectively coupling said keyboard to said means for storing information to insert data representing the vehicle's predetermined location in said means for storing information; and

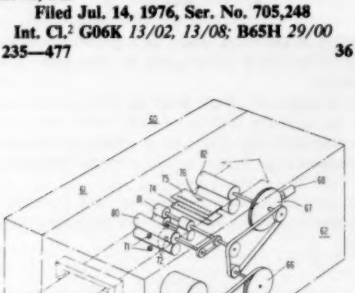
display means coupled to said means for storing information for displaying to the vehicle operator the current vehicle position.

4,145,606

ONE-AT-A-TIME CARD READER

Richard J. Auchinleck, Norristown; John C. Schisselbauer, Southampton; John S. Garczynski, Norristown; Charles C. Jablanofsky, Feasterville, and Charles J. Dobson, King of Prussia, all of Pa., assignors to Peripheral Dynamics, Inc., Norristown, Pa.

Filed Jul. 14, 1976, Ser. No. 705,248
Int. Cl.[2] G06K *13/02, 13/08;* **B65H** *29/00*
U.S. Cl. 235—477 **36 Claims**



1. A reader device for reading cards and the like one at a time, said cards having predetermined data columns, comprising:

a. a transport mechanism for transporting a card through a predetermined cycle;

b. input port means for admitting entry of said card to said transport mechanism;

c. data control means for reading data from said card and for providing data outputs representative of said read data;

d. position detectors for providing position outputs indicative of when said card has been transported to predetermined positions;

e. counter means for counting the distance that said card has been transported in terms of the number of said data columns through which said card has been transported;

f. transport control means for controlling said transport cycle, operatively in combination with said position detectors and said counter means, to transport said card in accordance with a predetermined portion of said card which is to be read, and for terminating said cycle upon the detection of a predetermined position of said card and upon a determination that said number has reached a predetermined count.

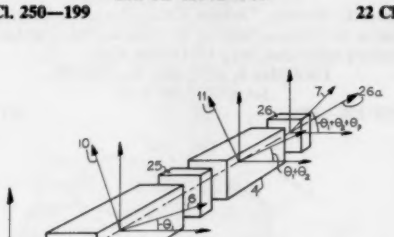
2. The apparatus as described in claim 1, wherein said transport mechanism carries said card over a path comprising a first forward segment and a second segment wherein said card is carried in a reverse direction over said same segment, said counter means comprising control means to provide for counting during both first and second segments.

4,145,607

SYSTEM AND METHOD FOR SHAPING PULSES OF OPTICAL RADIATION

Harry Bates, 635 Darcey Dr., Winter Park, Fla. 32792

Filed Dec. 16, 1976, Ser. No. 751,154
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **22 Claims**



1. A system for reshaping pulses of optical radiation comprising:

first means for receiving a polarized pulse input from a source of optical radiation and projecting said pulse into two orthogonally polarized beams;

second means for propagating said two beams together along a common axis of transmission;

third means for introducing a phase shift of at least 2π radians between said two beams;

fourth means for recombining said two beams into a common output; and wherein

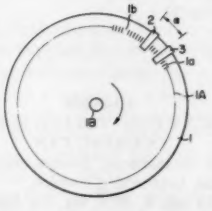
said output is reshaped with respect to said input pulse.

4,145,608

ROTATIONAL REFERENCE POSITION DETECTING APPARATUS

Shinji Shirasaki, Kariya; Takashi Yamada, Anjo; Hiroyasu Fukaya, Nagoya, and Yukio Sakakibara, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 14, 1977, Ser. No. 833,042
Claims priority, application Japan, Oct. 15, 1976, 51-124267
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 SE **4 Claims**



1. A rotational reference position detecting apparatus for use in an engine system comprising:

a rotor disk coupled with an engine to be rotated thereby;

a plurality of equispaced means provided on said rotor disk circularly except at a position indicative of the rotational reference position of said engine;

a first sensor, positioned adjacent to said rotor disk, for generating a first signal which changes the signal level

thereof in response to the passing of each of said equispaced means;

a second sensor positioned adjacent to said rotor disk for generating a second signal which changes the signal level thereof in response to the passing of each of said equispaced means, said second sensor being apart from said first sensor such that the level change of said first signal precedes the level change of said second signal; and

a detection circuit, connected to said first and second sensors, for generating a reference pulse by detecting the signal level of said first signal at each level change of said second signal, said reference pulse representing that said engine is rotated in a predetermined direction and to said rotational reference position.

4,145,609

SCINTILLATOR FOR A GAMMA RAY CAMERA

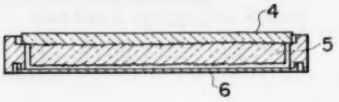
Katsumi Takami, Tokyo; Ken Ueda, Hachioji; Fumio Kawaguchi, Kokubunji; Teruichi Tomura, Kunitachi, and Kenji Ishimatsu, Abiko, all of Japan, assignors to Hitachi Medical Corporation, Japan

Filed Nov. 22, 1976, Ser. No. 744,157

Claims priority, application Japan, Nov. 28, 1975, 50-141635

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—361 R **6 Claims**



1. In a scintillator for Anger type camera apparatus having a scintillating crystal structure for producing light rays; and means for directing said light rays toward a photomultiplier; the improvement comprising said scintillating crystal having a thickness of 9 mm or less and upper and lower surfaces being roughly polished.

2. A scintillator as claimed in claim **1**, wherein said upper and lower surfaces are polished to a roughness of 400 to 120 grits.

4,145,610

METHOD OF AND DEVICE FOR COMPUTED TOMOGRAPHY

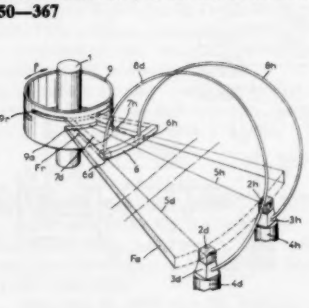
Jean R. Perilhou, Bourg-la-Reine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 6, 1977, Ser. No. 785,050

Claims priority, application France, Apr. 15, 1976, 76 11153

Int. Cl.[2] A61B *6/02;* **G01N** *23/08;* **G01T** *1/20*

U.S. Cl. 250—367 **7 Claims**



1. Apparatus for measurement of radiation absorption in an analysis plane comprising:

a plurality of scintillation detectors disposed in said analysis plane;

a like plurality of scintillation elements disposed in a reference plane which is not coplanar with said analysis plane;

radiation source means which function to project radiation along a plurality of reference lines, in said reference plane, to said scintillation elements and along a plurality of analysis lines, each of which coincide with a projection of a corresponding reference line in said analysis plane, to said scintillation detectors;

each of said scintillation detectors including a light conductor which transmits light produced in said detector to an associated photo electric converter;

each of said scintillation elements including an optical fibre disposed to transmit light produced in said element to the light conductor of the detector which is disposed on the corresponding analysis line; and

obturator means which alternately interrupts said projection of radiation in said analysis plane and said reference plane.

4,145,611

X-RAY SOURCE MOVING MECHANISM INTENDED FOR PANORAMIC RADIOGRAPHY

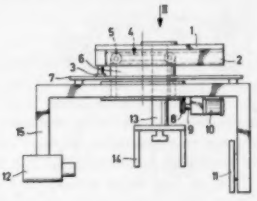
Veikko F. Valila, Vantaa, Finland, assignor to Den-Tal-Ez Mfg. Co., Des Moines, Iowa

Filed Dec. 7, 1977, Ser. No. 858,431

Claims priority, application Finland, Dec. 10, 1976, 763569

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—439 P **7 Claims**



1. A mechanism for moving an X-ray source around the patient's head so that the image of an object, having at least partly the shape of a dental arch, can be obtained on the film, said mechanism comprising

a stationary frame,

a rotatable support arm,

an X-ray source attached to one end of the support arm,

a film holder attached to the opposite end of the support arm, means for positioning the patient's head in the space between the X-ray source and the film holder, and

means for moving the center of rotation of the support arm, during the radiographing, rectilinearly in a direction perpendicular to the axis of symmetry of the dental arch, in such manner that the position of the center of rotation is dependent, in its rectilinear movement, on the angular position of the support arm at any given moment, with the purpose of directing the X-ray beam from the X-ray source so that at any given moment it is substantially perpendicular to that part of the object having the shape of the dental arch.

4,145,612

X-RAY PATIENT SUPPORT STRETCHER AND METHOD FOR FABRICATION

Adrianus A. G. Cooper, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

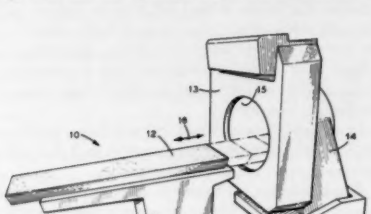
Filed Aug. 31, 1977, Ser. No. 829,401

Int. Cl.[2] G01N *21/00, 23/00;* **G21K** *5/06, 5/08*

U.S. Cl. 250—439 R **16 Claims**

1. A radiolucent support stretcher for supporting patients during X-ray examination which comprises: a balsa wood core having a longitudinal axis; a skin, said skin having a plurality of layers of oriented fibers bound in a polymeric resin matrix, said

plurality of layers being sandwiched between woven fabric prepreg; said skin being disposed about and bonded to said



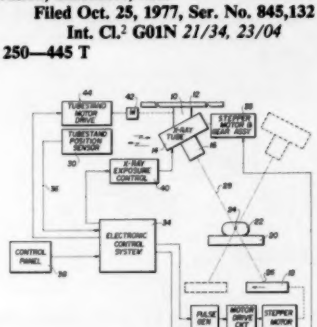
balsa wood core with said oriented fibers in parallel with said longitudinal axis.

4,145,613

MOTORIZED X-RAY TUBE ASSEMBLY

Laverne R. Bunch, Baltimore, Md., assignor to CGR Medical Corporation, Baltimore, Md.

Filed Oct. 25, 1977, Ser. No. 845,132
Int. Cl.[2] G01N *21/34, 23/04*
U.S. Cl. 250—445 T **14 Claims**



1. Apparatus including an X-ray source, an X-ray detector and means for rotating the X-ray source on a mounting structure relative to the X-ray receptor, comprising the improvement of:

a housing attached to said mounting structure and having a rotatable output shaft coupled to said X-ray source;

a spur gear set consisting of a plurality of intermeshed spur gears located within said housing and coupled to said output shaft;

a helicon gear set consisting of a pinion gear and a helicon gear located within said housing and including means for coupling said helicon gear to said spur gear set;

electrical stepper motor means having a rotary output shaft coupled to said pinion gear and being responsive to drive pulses applied thereto to incrementally rotate said output shaft in a predetermined direction for each drive pulse applied; and

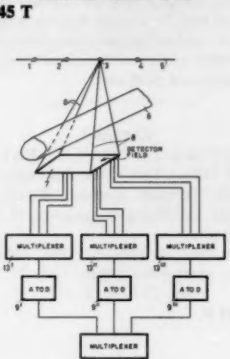
drive pulse circuit means coupled to said stepper motor and being operable to generate said drive pulses in response to a command signal applied thereto, said drive pulse circuit being operable to generate said drive pulses in response to positional change of said X-ray source and wherein said X-ray receptor is moved in an opposite direction with respect to the direction of the positional change of said X-ray source.

4,145,614

DEVICE FOR PRODUCING TWO- AND/OR THREE-DIMENSIONAL IMAGES OF THREE DIMENSIONAL OBJECTS

Günter Kowalski, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,619
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646118
Int. Cl.[2] A61B *6/02*
U.S. Cl. 250—445 T **3 Claims**



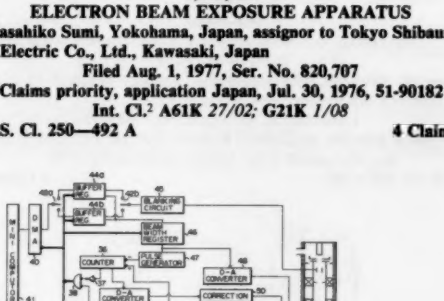
1. A device for producing two- and/or three-dimensional images of three-dimensional objects, comprising at least two radiation sources, a detector array, a computer, a processor and a display device, wherein a number of radiation sources are arranged on a straight line, the detector array includes a plurality of detector elements arranged in a plane parallel to the straight line, and further comprising means for processing signals derived from the detector elements and to supply them to the computer.

4,145,615

ELECTRON BEAM EXPOSURE APPARATUS

Masahiko Sumi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 1, 1977, Ser. No. 820,707
Claims priority, application Japan, Jul. 30, 1976, 51-90182
Int. Cl.[2] A61K *27/02*; G21K *1/08*
U.S. Cl. 250—492 A **4 Claims**



1. A radiant beam exposure apparatus for exposing an object by a plurality of radiant beam scanning lines to form a predetermined pattern on the object, comprising:

a radiant beam emitting system for emitting a radiant beam;

a memory for storing pattern information corresponding to a

pattern to be described on the object, the pattern information including a pattern repetition information corresponding to the number of scanning lines continuously describing the same pattern;

means for varying the width of the radiant beam which includes a mask disposed on the path of the radiant beam and having a slit extending in a direction perpendicular to the scanning lines, a signal generator for generating upon receipt of the pattern repetition information from the memory a beam width signal having a level corresponding to the pattern repetition, and a beam shifting means connected to the signal generator for shifting the radiant beam by a distance corresponding to the level of the beam width signal in a longitudinal direction of the slit of the mask so as to vary the width of the radiant beam landing on the object;

a deflection means for deflecting the radiant beam to form the scanning lines;

means for blanking the radiant beam correspondingly to the pattern information read out from the memory; and

a driving means for effecting a relative movement between the object and the radiant beam emitting system in two directions crossing each other.

4,145,616

X-RAY SOURCE ASSEMBLY

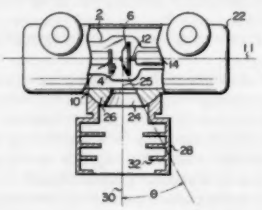
Kaname Tanabe, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 3, 1977, Ser. No. 838,968

Claims priority, application Japan, Oct. 5, 1976, 51-119578

Int. Cl.[2] H01J *35/16*; H05G *1/04*

U.S. Cl. 250—505 **5 Claims**



1. An X-ray source assembly comprising an X-ray tube including a glass envelope, a cathode installed in the glass envelope and provided with an electron-focusing electrode and a filament for emitting a focused electron beam, and an anode-target installed in the glass envelope and provided with an electron-receiving surface facing the cathode; a housing in which said X-ray tube is disposed and which has an X-ray radiation port for radiating X-ray emanated from the X-ray tube; and a collimator kept in contact with the X-ray radiation port, the axis of the collimator passing a point where the electron beam impinges on the electron-receiving surface and being swingable about said point relative to the axis of the X-ray radiation port in the plane including the axis of the X-ray tube and the axis of the X-ray radiation port, thereby controlling the size of X-ray radiation field.

4,145,617

CONTROL CIRCUIT FOR PROVIDING TIME SELECTED APPLICATION OF A.C. POWER

John H. Lee, North Oaks, and Peter A. Lind, Afton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 25, 1977, Ser. No. 818,652

Int. Cl.[2] H01H *43/00*

U.S. Cl. 307—43 **9 Claims**

1. A control circuit for providing time selected outputs of A.C. power including:

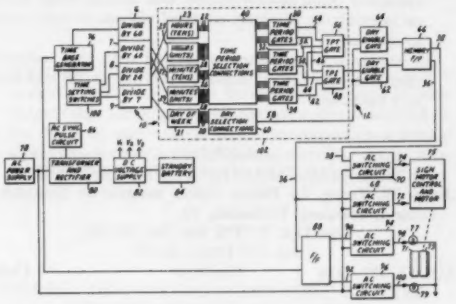
an A.C. powered D.C. voltage supply;

a solid-state, 7-day, 24-hour clock connected to said D.C. voltage supply and operative in response to timing pulses and having time indicating outputs;

a crystal controlled time base generator connected to said A.C. powered D.C. voltage supply and connected to said clock for providing timing pulses to said clock;

means responsive to A.C. power and operatively connected to said time base generator for providing a pulse for each cycle of A.C. power to said time base generator for synchronizing the operation of said generator;

programmable control circuitry having a control signal output, said programmable control circuitry selectively connectable to said time indicating outputs for alternately



providing initiating and terminating signals at said control signal output in accordance with times presented by said clock at said time indicating outputs corresponding to select connections when made between said time indicating outputs and said programmable control circuitry; and

a solid-state A.C. power switching means having a control input, an A.C. power input and an A.C. power output, said control input connected to said control signal output of said programmable control circuitry, said switching means providing a conductive path for A.C. power from said A.C. power input to said A.C. power output in accordance with said initiating and terminating signals provided at said control signal output of said programmable control circuitry.

4,145,618

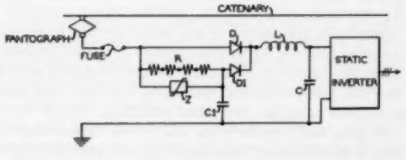
ARRANGEMENT FOR PROVIDING AUXILIARY ENERGY SOURCE FOR STATIC INVERTER USED WITH TRACTION MOTOR DRIVE DURING POWER INTERRUPTION

Ettore Restori, and Giuseppe Careglio, both of Turin, Italy, assignors to WABCO Westinghouse, Turin, Italy

Filed Sep. 15, 1977, Ser. No. 833,528

Int. Cl.[2] H02J *9/00*

U.S. Cl. 307—64 **2 Claims**



1. A power supply system for a traction vehicle including a static inverter to which energy is normally supplied from a high voltage catenary via the vehicle pantograph, an input filter formed in part by capacitor means for smoothing voltage surges in the high voltage supplied to said inverter, fuse means between the input filter and vehicle pantograph, a first diode

between said fuse means and said input filter, and an auxiliary circuit in parallel with said first diode comprising:

(a) a second diode having its cathode connected to the cathode of said first diode;

(b) resistance means connected between the anodes of said first and second diodes;

(c) an auxiliary capacitor connected between said resistance means and said second diode so as to be charged from said high voltage catenary via said resistance means, the value of said resistance means being such as to prevent interruption of the supply of power to said inverter by said fuse means in the event of a short circuit of said auxiliary capacitor and to permit the size of said auxiliary capacitor to be selected in accordance with a maximum voltage less than the maximum voltage of said catenary, said auxiliary capacitor being discharged via said second diode during an interruption of power supplied via said vehicle pantograph; and

(d) voltage control means in parallel with said resistance means for dissipating catenary overvoltages via said auxiliary capacitor.

4,145,619

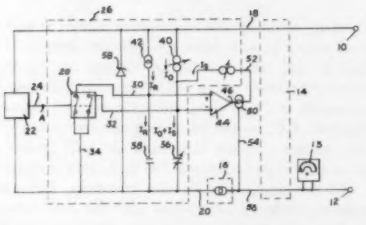
TWO WIRE CAPACITANCE TRANSMITTER

James W. Tseng, La Palma, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 3, 1976, Ser. No. 747,403

Int. Cl.[2] H01H *35/18*

U.S. Cl. 307—118 **7 Claims**



1. A capacitance transmitter to develop an output current porportional to a sensed value of capacitance of a probe member which comprises:

first and second conductors;

base current generator means in circuit therewith to provide a constant, base current flow therethrough;

multivibrator circuit means including probe capacitance means and reference capacitance means;

first and second current control circuit means to apply charging currents of controlled magnitude to each of said capacitance means and switch means to cyclically and simultaneously ground both said capacitance means, discharging voltages developed thereon;

oscillator means to produce a train of square wave voltage pulses of predetermined constant time duration separated by intervals of a second, predetermined constant time operatively connected to said switch means to provide, in a cyclic fashion, a charging period of predetermined constant time duration separated by a discharging period of a second, predetermined, lesser and constant time interval;

capacitance charge rate discriminating means receiving charging rate signals from said probe capacitance means and said reference capacitance means and developing an output current responsive to differences in said charging rate signals;

feedback circuit means from said charge rate discriminating means to said multivibrator circuit means to vary the current to said probe capacitance means proportionally in response to said output current and thereby maintain a constant charge rate on both said capacitors; and

summation circuit means receiving said circuit constant base current and said discriminating means output current.

4,145,620

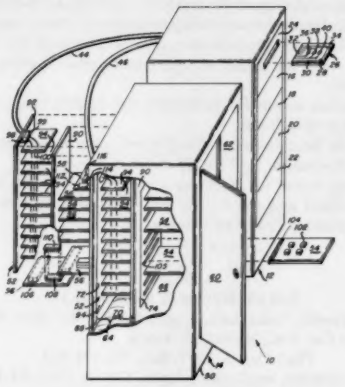
MODULAR DYNAMIC BURN-IN APPARATUS

Charles A. Dice, Milpitas, Calif., assignor to Serel Corporation, Milpitas, Calif.

Filed Oct. 5, 1977, Ser. No. 839,665

Int. Cl.[2] H02J *13/00*

U.S. Cl. 307—149 **5 Claims**



1. A system for generating exercising signals for an integrated circuit burn-in apparatus comprising:

power supply means for developing integrated circuit biasing potentials;

an oven for receiving a plurality of integrated circuits to be burned-in;

a plurality of modules each having a plug-in pattern generator for generating integrated circuit exercising signals of a type programmed by a first plug-in header;

a plurality of driver cards for fault monitoring and for developing amplified exercising signals on output terminals programmed by a second plug-in header;

a plurality of socket cards for carrying the integrated circuits to be burned-in, and

a module removably disposed in a rear wall of the oven, the module having connectors on the outside of the oven for receiving the pattern generator and the driver cards and connectors on the inside of the oven for receiving the socket cards, the module being operative to couple the power from the power supply means to the pattern generator and the driver cards, to couple the exercising signals from the pattern generator to the driver cards, and to couple the amplified exercising signals and power from the driver cards to the socket cards whereby the type of exercising signals and routing of the power and exercising signal are programmed by the headers as required by the type of integrated circuits to be burned-in.

4,145,621

TRANSISTOR LOGIC CIRCUITS

Stephen F. Colaco, Manchester, England, assignor to Ferranti Limited, Hollinwood, England

Continuation of Ser. No. 504,731, Sep. 10, 1974, abandoned, which is a continuation of Ser. No. 336,373, Feb. 27, 1973, abandoned. This application Jan. 19, 1976, Ser. No. 650,032

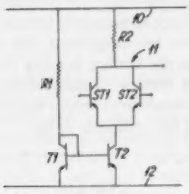
Claims priority, application United Kingdom, Mar. 4, 1972, 10200/72

Int. Cl.[2] H03K *19/08, 19/34*

U.S. Cl. 307—215 **21 Claims**

1. A transistor logic circuit which is to be supplied with electrical energy from a low voltage source and the different

logic states of which are to be determined by input signals having voltage levels with only a small range of values, the logic circuit consisting of a constant current source and a plurality of logic gates each including only a gating combination of switching transistors connected in parallel with each other and in series with a load resistor, the load resistor also being connected to a point to be maintained at a predetermined potential level by the low voltage source, each said gating combination having a common output connected to the collector of each switching transistor of said gating combination and to the load resistor, and a plurality of base inputs equal in number to said plurality of switching transistors, at least one of said inputs to the gating combination being connected individually from a base of one of the switching transistors, to the common output of another gating combination, and the emitter of each switching transistor being connected to the constant current source, said constant current source comprising a current mirror including at least the equivalent of a first circuit including a first transistor having a collector connected to the



base of the first transistor, means for connecting said collector via a load resistor to a first supply line adapted to be maintained at a first potential level, and a second circuit including a plurality of second transistors having a collector connected to one of the plurality of logical gating combination of switching transistors, means for connecting the emitters of the first and second transistors to a second supply line adapted to be maintained at a second potential level, and means for connecting the bases of the first and second transistors together, said first and said second transistors being of the same conductivity type as the switching transistors, the arrangement of the transistor logic gates being such that the switching transistors do not saturate when conductive, and in relation to the gating combination of switching transistors, the desired logic function is obtained by a constant current flowing through the gating combination of switching transistors as at least one of said switching transistors is switched ON, and substantially no current flows through the logical gating combination of switching transistors as all said switching transistors are switched OFF.

4,145,622

DECODER CIRCUIT ARRANGEMENT WITH MOS TRANSISTORS

Ruediger Hofmann, Munich, and Paul-Werner von Basse, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 17, 1977, Ser. No. 825,274

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641693

Int. Cl.[2] **H03K** *19/08, 19/34;* **G11C** *8/00;* **H03K** *5/153*

U.S. Cl. 307—270 **3 Claims**

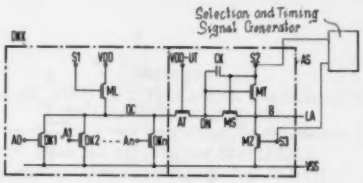
1. A decoder circuit arrangement comprising

a decoder circuit comprising a plurality of parallel-connected MOS transistors having a plurality of inputs for receiving signals to be decoded and a decoder output for emitting a decoded signal,

an output stage including an input connected to said output of said decoder circuit and having an output, and a pair of control signal inputs,

an MOS driver transistor in said output stage including a controlled path connected between one of said control inputs for receiving a selection signal, and said output of said output stage and including a gate connected to said output of said decoder circuit,

a shunt MOS transistor in said output stage including a controlled path connected between said output of said decoder circuit and said output of said output stage and having a gate connected to said one control input, and



an additional MOS transistor in said output stage including a controlled path connected between said output of said output stage and a fixed potential and a gate connected to the other of said control inputs for receiving a timing signal which renders said additional transistor conductive at least during the time in which the selection signal is not present.

4,145,623

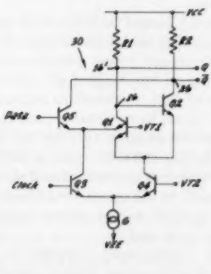
CURRENT MODE LOGIC COMPATIBLE EMITTER FUNCTION TYPE LOGIC FAMILY

Richard L. Doucette, San Marcos, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 4, 1977, Ser. No. 839,342

Int. Cl.[2] **H03K** *19/08, 3/286*

U.S. Cl. 307—289 **11 Claims**



1. A latch circuit having means for connecting said latch circuit to a constant current source and a negative voltage supply and to a positive voltage supply comprising:

a first gain element having a base, a collector, a plurality of emitters with its collector serving as a true output and with its base connected to a first threshold voltage reference;

a second gain element having a base, a collector, at least one emitter connected in common to a first emitter of the first gain element with its collector serving as a complement output, and having its base connected to the collector of the first gain element;

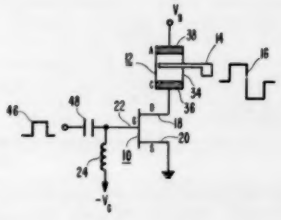
a third gain element having a base, a collector, and at least one emitter connected in common to a second emitter of said first gain element and with its base serving as an input and its collector connected in common to the collector of said second gain element to also serve as a complement output; and

resistance means connected between said positive voltage supply and the common connector of the collectors of said second and third gain elements.

4,145,624
FET-TELD COMBINATION WITH CAPACITIVELY COUPLED OUTPUT ELECTRODE MEANS

Lakshminarasimha C. Upadhyayula, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,692
Int. Cl.[2] H01L *27/26;* **H03K** *19/40, 19/08*
U.S. Cl. 307—299 R **5 Claims**



1. In combination:

a field effect type transistor having drain, gate and source electrodes, said transistor being characterized by an ohmic region of operation in which the drain current varies with voltage and a constant-current region of operation in which the drain current is substantially constant with voltage;

a transferred electron type device connected to said transistor to form a series current therethrough, said device being characterized by a transfer of electrons from a high to a low mobility sub-band and the formation of domains upon the application of an electric field above a threshold value, said device having a peak current at the threshold voltage and a lower current above the threshold voltage, said lower current being substantially constant with increasing voltage;

said transistor being biased to operate in said constant-current region such that said drain current is below said peak current and above said lower current of said device;

means for applying an input signal of a given polarity to the gate electrode of said transistor to increase the drain current to a level equal to or greater than the threshold current of said device causing thereby the formation of domains in said device and a decrease in said drain current to the level of said lower current of said device and producing thereby a shift in the operation of said transistor to said ohmic region and an output pulsed signal of a predetermined voltage gain; and

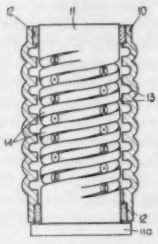
electrode means capacitively coupled to said device for transmission of said output pulsed signal, the capacitive coupling of said electrode means producing an alternating positive and negative polarity in said output pulsed signal.

4,145,625
ELECTRO-MAGNETIC DEVICES

Alec H. Seilly, North Wembley, England, assignor to Simms Group Research & Development Limited, Birmingham, England

Continuation-in-part of Ser. No. 649,735, Jan. 16, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 823,011
Claims priority, application United Kingdom, Jan. 25, 1975, 3351/75
Int. Cl.[2] H02K *33/00*
U.S. Cl. 310—27 **2 Claims**

1. An electromagnetic actuator comprising a first member of generally annular form, a second member having a cylindrical surface presented to one boundary surface of said first member, said surfaces being in spaced relationship, bearing means for guiding relative axial movement of the members, said second member in use being fixed, each of the portions of said members defining said surfaces being formed from magnetizable material, a two or a multiple of two, start helical thread formation formed in each of said surfaces, the thread formation in each surface providing two or a multiple of two helical ribs which are separated by helical grooves, and an electric winding carried by said second member, said winding when energized caused said ribs or adjacent ribs on said second member to be oppositely magnetically polarized, whereby the first

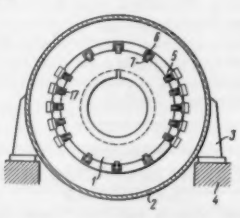


member will be subject to magnetic forces acting to move the ribs on the members into alignment, the surface of the first member opposite to the surface bearing the thread formation being shaped by a further thread formation to reduce the section of the first member to permit rapid movement thereof under the action of the magnetic field.

4,145,626
ELASTIC MOUNTING OF A CORE IN AN ELECTRIC MACHINE STATOR

Jury V. Aroshidze, Moskovsky prospekt, 199, kv. 37; Vadim I. Iogansen, Gavanskaya ulitsa, 34, kv. 167; Ibragim A. Kadiogly, Tallinskoe shosse, 66, kv. 180; Jury V. Petrov, prospekt Kosmonavtov, 50, korpus 4, kv. 24; Izrail A. Ptakul, Pulkovskaya ulitsa, 17, kv. 158; Vasily V. Romanov, Naberezhnaya Chernoi Rechki, 18, kv. 30; Vasily L. Sudarikov, ulitsa Bela Kuna, 13, kv. 32; Vladimir P. Chernyavsky, Pulkovskaya ulitsa, 17, kv. 185; Aron B. Shapiro, Basseinaya ulitsa, 53, kv. 71, and Gennady V. Shkoda, Bukharestskaya ulitsa, 39, korpus 3, kv. 38, all of Leningrad, U.S.S.R.

Filed Feb. 14, 1977, Ser. No. 768,289
Int. Cl.[2] H02K *5/00*
U.S. Cl. 310—91 **8 Claims**



1. A stator of an electric machine mounted on a base, comprising:

a frame mounted on said base by supporting feet, portions of said frame adjacent said supporting feet being portioned of highest rigidity, and portions not adjacent to supporting feet being portions of lowest rigidity

a laminated core supported in said frame and having slots arranged substantially at equally spaced intervals around the periphery of an outer surface of said core;

a plurality resilient support ribs located in said slots adjacent said portions of said frame of highest rigidity and secured to said frame in said portions of highest rigidity to axially restrain said core and to support said core in said frame; and

a plurality of non-resilient support ribs located in said slots adjacent said portions of lowest rigidity to axially restrain

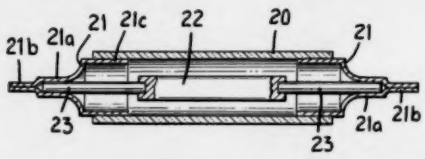
said core and to provide for uniform compression of said core.

4,145,627

CRIMPED SEAL PIEZOELECTRIC RESONATOR PACKAGE

Tadao Ishizawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Feb. 25, 1977, Ser. No. 772,148
Claims priority, application Japan, Feb. 25, 1976, 51-19556
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—344 **9 Claims**



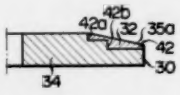
1. A resonator packaging comprising a tubular dielectric case, an electrically conductive cap at each end of said case, and a resonator positioned in said case between the ends thereof, said resonator having supporting lead members fixed thereto and projecting respectively into said caps at opposite ends of said case, each of said caps comprising a continuous length of metal tubing having a cylindrical inner end portion sealed to said tubular case, and an intermediate portion and outer end portion projecting beyond the respective end of said case, said outer end portion being pressed flat with a width at least as great as the diameter of said cylindrical inner end portion and hermetically closed to seal said case, the interior of which is evacuated, and said intermediate portion constituting a transition between said cylindrical inner end portion and said flat outer end portion and having opposite sides pressed onto the respective lead member of said resonator securely to grip and hold said lead member to support said resonator and to make electrical contact with said lead member.

4,145,628

ROTATING ANODE X-RAY TUBE

Kenji Iwasaki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 3, 1977, Ser. No. 793,432
Claims priority, application Japan, May 10, 1976, 51-52973
Int. Cl.[2] H01J *35/10*
U.S. Cl. 313—60 **2 Claims**



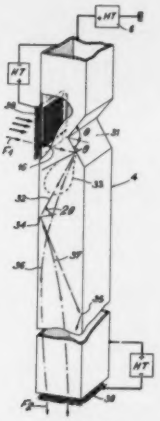
1. A rotating anode X-Ray tube comprising:
an evacuated envelope;
a cathode having an eccentrically disposed focusing electrode, said cathode being hermetically sealed to one end of the evacuated envelope; and
an anode having a rotary shaft and an anode target mounted on the rotary shaft, the anode being hermetically sealed to the other end of the evacuated envelope so as to face the cathode, the anode target comprising a target base having a stepped annular depression formed on the very end portion of the upper side thereof, said depression having planes substantially perpendicular to the axis of the rotary shaft, and an annular electron-impact layer having a stepped underside corresponding to the stepped annular depression of the electron-impact layer, said impact layer being adhesively bonded to said perpendicular planes of the stepped annular depression.

4,145,629

SOURCE OF IONS OF HIGH MASS, ESPECIALLY IONS OF URANIUM OXIDE UO_2

Fernand M. Devienne, 117 La Croisett, 06400 Cannes, France

Filed Jul. 21, 1976, Ser. No. 707,319
Claims priority, application France, Jul. 25, 1975, 75 23353; Dec. 18, 1975, 75 38913
Int. Cl.[2] H01J *27/00*
U.S. Cl. 313—230 **14 Claims**



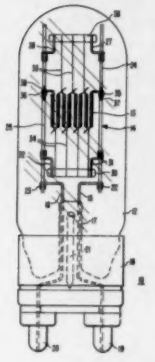
1. A source of ions of high mass and of intensity not less than 10 mA, especially of ions of uranium oxide UO_2, wherein said source comprises, within an evacuated chamber:
a source of primary ions,
a charge-exchange box which is fed at the inlet by said source of primary ions and delivers at the outlet a primary molecular or atomic beam which is at least partially neutralized,
a target of material to be ionized which intercepts the emergent primary beam from the change-exchange box,
an enclosure enclosing space in the immediate vicinity of said target and surrounding at least a volume of space in front of the surfaces of said target exposed to said primary beam, said enclosure being provided with means for bringing said enclosure to a potential relative to ground which corresponds in polarity to that of the ions produced by interception of said primary beam by said target, said enclosure having two apertures, a first aperture disposed so as to permit entry of said primary beam of interception thereof by said target and a second aperture disposed so as to allow exit of a high intensity jet of ions of high mass produced by impact of said primary beam on said target,
said target having a geometrical configuration such that the primary molecular or atomic beam which produces ions by sputtering when intercepted by said target undergoes multiple reflections from said target and consequently makes a number of impacts producing secondary ions of high mass before all of said ions of high mass are extracted from said enclosure.

4,145,630

HALOGEN-CYCLE TYPE INCANDESCENT LAMP

Aristide R. DeCaro, Edison, and Nicholas J. Rainone, Clifton, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1977, Ser. No. 857,475
Int. Cl.[2] H01K *1/18, 1/50*
U.S. Cl. 313—273 5 Claims



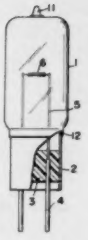
1. A halogen-cycle type incandescent lamp comprising;
a sealed light-transmitting envelope of vitreous material,
a pair of rigid lead-in wires extending into said envelope and terminated by helically-coiled segments,
an inert fill gas and a tungsten wire filament within said envelope, said filament being of planar configuration and having a plurality of coiled sections that are joined by uncoiled segments of the filament wire,
means within said envelope for providing a halogen atmosphere in the lamp during the operation thereof, and
a mount assembly holding the planar filament in a predetermined position within the envelope and comprising (a) a pair of substantially straight support rods extending along opposite sides of the planar filament, (b) a pair of insulating bridge members extending transversely between said support rods and defining therewith a frame-like structure that surrounds the planar filament, (c) coupling components fastening the support rods to the ends of said bridge members, and (d) auxiliary support wires anchored in said bridge members and engaging the said uncoiled wire segments of the filament,
each of said coupling components comprising a rigid metal wire member having one end anchored in the associated bridge member and its other end terminated by a coiled segment that encircles and mechanically grips the associated support rod,
said planar filament having coiled leg portions that encircle and are mechanically secured to said support rods, and
the ends of said support rods extending through and being mechanically gripped by the coiled terminating segments of said lead-in wires so that said mount assembly, lead-in wires and bridge members are held in operative relationship with one another solely by mechanical means without any welds or fusion-type junctures of the metal components.

4,145,631

INCANDESCENT LAMP

Sozo Saito, Tokyo, Japan, assignor to Kondo Sylvania Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1977, Ser. No. 809,070
Claims priority, application Japan, Apr. 23, 1977, 52-47055
Int. Cl.[2] H01K *1/22, 1/28, 1/36*
U.S. Cl. 313—315 2 Claims



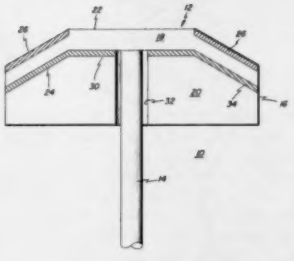
1. An incandescent lamp comprising:
a metal ring body having a circular cross-section, first and second ends, smooth inner and outer surfaces, and first and second oxidation layers on said inner and outer surfaces, respectively;
a light transparent bulb having an exhaust pipe therein and an open end, the inner surface of said open end of said bulb being welded to said outer surface of said metal ring body, at said first end thereof only, by means of said second oxidation layer, to thereby form a hermetic seal therebetween;
a cylindrical stem having an outer diameter equal to the inner diameter of said metal ring body, the entire outer circumference of said stem being welded to said inner surface of said metal ring body, at a position between said first and second ends thereof, by means of said first oxidation layer, to thereby form a hermetic seal therebetween, said second end of said metal ring body extending beyond said stem;
a light emitting filament positioned within said bulb; and
lead wires extending through said stem into said bulb and supporting said filament for applying voltage thereto.

4,145,632

COMPOSITE SUBSTRATE FOR ROTATING X-RAY ANODE TUBE

Thomas M. Devine, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,245
Int. Cl.[2] H01J *35/08*
U.S. Cl. 313—330 12 Claims



1. A composite substrate for use in a rotating x-ray anode tube comprising
a first member,

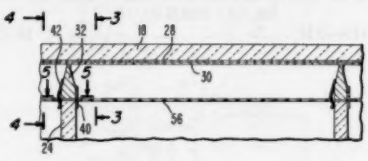
a second member comprising graphite, and
a layer of metal consisting essentially of a non-carbide forming material joining the first member to the second member,
the metal is a material in which the solubility of carbon therein is practically zero up to a temperature of about 1300° C. but in which from 1 to 4 atomic weight percent of carbon is soluble therein at the temperature of joining the first member to the second member, and
the metal is soluble in the material of the first member.

4,145,633

MODULAR GUIDED BEAM FLAT DISPLAY DEVICE

Kenneth D. Peters, West Windsor, and Charles H. Anderson, Rocky Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 12, 1977, Ser. No. 796,337
Int. Cl.[2] H01J *31/00*
U.S. Cl. 313—422 **10 Claims**



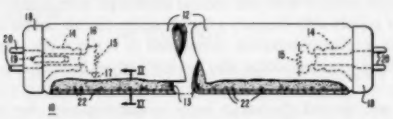
1. A display device comprising
an evacuated envelope having spaced, substantially parallel front and back walls and spaced, substantially parallel support walls extending between and substantially perpendicular to the front and back walls, said support walls forming a plurality of parallel channels extending along said front and back walls,
a separable metal tip compressed between the front wall and each of said support walls and extending along the support wall, each of said tips having a thickness at the support wall substantially equal to the thickness of the support wall and tapering to a thinner thickness at the front wall, and
means preventing movement of each of said tips in a direction transversely of the channels so as to maintain the metal tips against the support walls.

4,145,634

FLUORESCENT LAMP HAVING INTEGRAL MERCURY-VAPOR PRESSURE CONTROL MEANS

George S. Evans, Caldwell, and Henry Skwirut, Verona, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1978, Ser. No. 878,848
Int. Cl.[2] H01J *61/28, 61/42*
U.S. Cl. 313—490 **18 Claims**



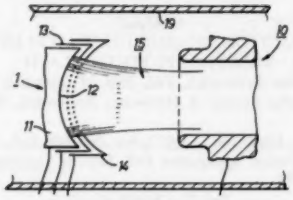
1. In a mercury-vapor discharge lamp of a type which requires the presence of a predetermined quantity of mercury vapor during operation for optimum light output, the combination of;
a sealed light-transmitting envelope that contains spaced electrodes and an ionizable medium which includes mercury, and
means in said envelope for providing said predetermined quantity of mercury vapor and regulating the mercury-vapor pressure within the lamp during the operation thereof comprising a plurality of discrete bodies of a metal that combines with the mercury within the lamp and forms an amalgam which releases mercury vapor when the lamp is energized and the amalgamative metal bodies are exposed to heat generated by the lamp, said bodies of amalgamative metal being (a) completely mobile and free to move about within the sealed envelope, (b) gravitationally distributed at random locations within said envelope, and (c) of such size that, when combined with the mercury, they form an amalgam of predetermined composition which releases said predetermined quantity of mercury vapor despite the random location of the amalgamative metal bodies.

4,145,635

ELECTRON EMITTER WITH FOCUSSING ARRANGEMENT

Richard A. Tuck, Slough, England, assignor to E M I Varian Limited, Hayes, England

Filed Nov. 2, 1977, Ser. No. 847,857
Claims priority, application United Kingdom, Nov. 4, 1976, 45835/76
Int. Cl.[2] H01J *23/08*
U.S. Cl. 315—5.39 **10 Claims**



1. An electron emitter including:
a body of material which has a plurality of projections forming field emitter zones, which zones are separated by regions having no substantial projections and are thus not field emissive;
a foraminous extractor electrode arrangement adjacent the body for receiving an extractor potential to apply an electron extraction field to the projections to draw electrons from the projections; and
a foraminous focus electrode arrangement for receiving a further potential and positioned on that side of the extractor arrangement remote from the body;
means for applying the potentials to the electrode arrangements;
the potential applying means being so arranged and the electrode arrangements being so positioned relative to one another and to the zones, that the electrode arrangements electrically interact to form a plurality of electric focussing fields to cause electrons drawn from respective ones of the zones to converge onto predetermined paths, each zone being aligned with corresponding openings in both the electrode arrangements and each said region being aligned with corresponding material portions of the electrode arrangements.

4,145,636

FLUORESCENT LAMP DRIVING CIRCUIT

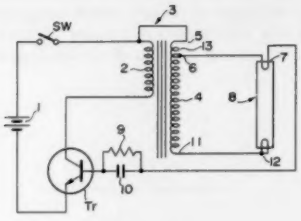
Shigemitsu Doi, Kawagoe, Japan, assignor to I. S. Engineering Co., Ltd., Kawagoe, Japan

Filed Aug. 8, 1977, Ser. No. 822,642

Claims priority, application Japan, Aug. 9, 1976, 51-105536[U]

Int. Cl.[2] H05B *39/00, 41/14*

U.S. Cl. 315—101 3 Claims



1. A relaxation oscillator circuit for driving a fluorescent lamp with a D.C. power source comprising a transistor having a first electrode connected to one terminal of the D.C. power source, and a transformer having a primary winding one end of which is connected to the other terminal of the D.C. power source and the other end being connected to a second electrode of said transistor, said transformer having a first secondary winding connected at one end thereof to said other terminal of the D.C. power source and at the other end thereof to a third electrode of said transistor through a resistor and one of a pair of filaments of the fluorescent lamp, said transformer also having a second secondary winding connected across the pair of filaments of the fluorescent lamp.

4,145,637

CAPACITOR CHARGE INDICATOR IN AN ELECTRONIC PHOTOFLASH

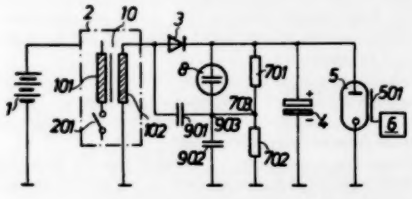
Hans G. Giese, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,314

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626673

Int. Cl.[2] H05B *41/32*

U.S. Cl. 315—241 P 4 Claims



1. Electronic flash apparatus having a storage capacitor chargeable through a direct-current converter and having a glow lamp arranged to light at a predetermined threshold voltage corresponding to a specific charge voltage of said storage capacitor, said glow lamp being arranged so that said predetermined threshold voltage approximately equals the burning voltage of said glow lamp, means for applying periodic ignition pulses to said glow lamp, said pulse applying means being arranged for deriving said ignition pulses from voltage pulses occurring during periodic switching of said converter, said converter being a transformer having a secondary winding connected through a rectifier with said storage capacitor, a resistance voltage divider connected in parallel with said storage capacitor, said glow lamp being connected with a divider tap of said resistance voltage divider, said flash apparatus further comprising a capacitive voltage divider arranged for detecting voltage variations occurring at said secondary winding of said transformer on periodic switching of said converter, and circuit means connecting a divider tap of said capacitive voltage divider with said glow lamp and with said divider tap of said resistance voltage divider.

4,145,638

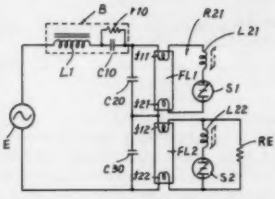
DISCHARGE LAMP LIGHTING SYSTEM USING SERIES CONNECTED STARTERS

Isao Kaneda, Otsu, Japan, assignor to NEC Sylvania Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 579,092, May 20, 1975, Pat. No. 4,081,718. This application Nov. 16, 1977, Ser. No. 851,943

Int. Cl.[2] H05B *41/16*

U.S. Cl. 315—323 14 Claims



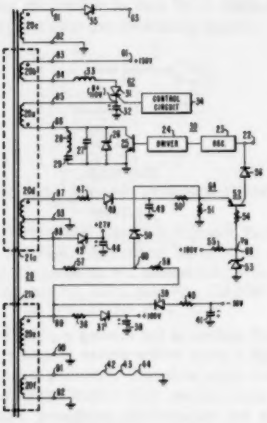
1. A discharge lamp lighting system for first and second discharge lamp means including respective filament means, said system comprising power input supply terminals, means for connecting said first and second discharge lamp means in series to form a first series circuit, ballast means connected in series with said first series circuit, said ballast means and said first series circuit being connected serially between said power supply terminals, said ballast means comprising a substantially linear inductor, a second series circuit comprising first and second starting booster means, means connecting said first and second starting booster means in parallel with said first and second discharge lamp means respectively, said first starting booster means comprising a capacitor connected in parallel with said first discharge lamp means at the power supply side thereof, a third series circuit comprising a first nonlinear inductor connected in series with a first switching semiconductor having a given breakdown voltage, and means connecting said third series circuit in parallel with said first discharge lamp means opposite the power supply side thereof, said second starting booster means comprising a second capacitor connected in parallel with said second discharge lamp means at the power supply side thereof, a fourth series circuit comprising a second nonlinear inductor connected in series with a second switching semiconductor also having a given breakdown voltage, and means connecting said fourth series circuit in parallel with said second discharge lamp means opposite the power supply side thereof, and wherein the sum of the breakdown voltages of said first and second switching semiconductors is higher than the source voltage at said power supply terminals, said system further comprising voltage dividing means responsive to voltages at said power supply terminals for applying a breakdown voltage to the switching semiconductor of said first starting booster means before the operation of said second starting booster means, whereby said first and second starting booster means are sequentially operated for starting said discharge lamp means in a stable manner.

4,145,639

TELEVISION RECEIVER PROTECTION CIRCUIT

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 27, 1977, Ser. No. 846,196
Int. Cl.² H01J 29/70
U.S. Cl. 315—411 **18 Claims**



1. A television receiver protection circuit comprising:
a deflection winding;
a deflection circuit coupled to said deflection winding for producing scanning current in said deflection winding during a deflection cycle, said deflection circuit including first and second terminals at which respective terminals first and second deflection rate voltages are developed, said first deflection rate voltage including under fault conditions a fault component voltage present during at least a portion of said deflection cycle, said fault component voltage substantially absent from said second deflection rate voltage during said portion;
combining means coupled to said first and second terminals for combining said first and second deflection rate voltages for producing a fault signal at a third terminal under fault conditions; and
a safety circuit responsive to the voltage developed at said third terminal for providing a disabling signal for disabling normal television receiver operation when said fault signal is present.

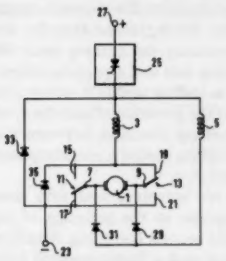
4,145,640

ELECTRIC CART DRIVE CONTROL SYSTEM

Dieter Kipp, Vaihingen; Herbert Aman, Aich, and Rudolf Hansen, Freising, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1977, Ser. No. 852,465
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657920
Int. Cl.² H02P 7/28
U.S. Cl. 318—139 **6 Claims**

1. An electric cart drive control system comprising an electric driving motor having both a series field winding (3) and a shunt field winding (5) as well as an armature winding (1) and a source (25) of variably pulsed dc voltage of constant polarity, including at least one semiconductor controlled rectifier (thyristor), for controlling the speed of and energizing said motor, said control system further comprising:
switch means (11,13) for reversing said motor, through which means said armature winding is connected to said series field winding (3) and in circuit with said pulse voltage source (25) for each direction of operation of said motor, and
diodes (29,31) having their like terminals connected to the same end of said shunt field winding (5) respectively interposed between said end of said shunt field winding and the two ends of said armature winding (1), the other



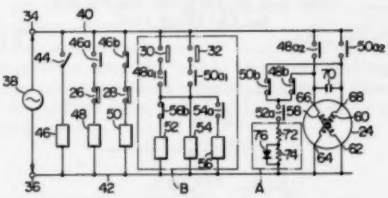
end of said shunt field winding being connected to said pulse voltage source (25), said diodes being poled for conduction of current from said source.

4,145,641

AUTOMATICALLY-OPENABLE-AND-CLOSABLE-DOOR OPERATING APPARATUS

Kazuyoshi Ozaki, 9-1, Asahigaokacho, Suita-shi, Osaka, Japan

Filed Sep. 15, 1977, Ser. No. 833,699
Claims priority, application Japan, Mar. 19, 1977, 52-30882
Int. Cl.² H02P 7/36
U.S. Cl. 318—269 **6 Claims**



1. An automatically-openable-and-closable-door operating apparatus comprising:
a door arranged to run between a first position at which the door is opened and a second position at which the door is closed and normally held in said second position;
a capacitor motor mechanically coupled with said door and reversibly operable between a rotation in a forward direction for causing said door to run in a first travelling direction from said second position to said first position and a rotation in a backward direction for causing said door to run in a second travelling direction in opposite to said first travelling direction;
approach sensing means for sensing a person who is present at a location spaced a predetermined distance from the door and actuated thereby;
a first motor controlling means for causing said motor to rotate in said forward direction in response to the actuation of said approach sensing means;
second motor controlling means for causing said motor to rotate in said backward direction in response to the non-actuation of said approach sensing means;
third motor controlling means responsive to the presence of said door at said second position and the non-actuation of said approach sensing means to deenergize said motor and stop the rotation thereof;
fourth motor controlling means responsive to the presence of said door at said first position and the actuation of approach sensing means to deenergize said motor and stop the rotation thereof;

fifth motor controlling means operable when actuated to change, for a predetermined period, the normal operation state of said motor for producing a driving force to the dynamic braking mode for producing a braking force and thereafter to alternate the normal operation mode for producing the driving force and the dynamic braking mode for producing the braking force with a predetermined repetitive rate and a predetermined duty cycle;

first means for actuating said fifth motor controlling means in response to the presence of said door, when running in said first travelling direction, between said first position and a third position spaced a predetermined distance from said first position;

second means for actuating said fifth motor controlling means in response to the presence of said door, when running in said second travelling direction, between said second position and a fourth position spaced a predetermined distance from said second position;

terminal means arranged for connection to an external AC power source; and

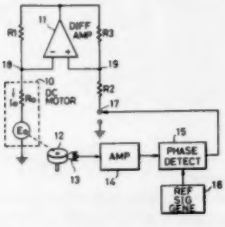
means for electrically connecting said terminal means to said capacitor motor.

4,145,642

SYSTEM FOR CONTROLLING THE ROTATION OF A DC MOTOR

Yoshiteru Kosaka, Kamakura, and Seisuke Hiraguri, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 17, 1977, Ser. No. 825,440
Int. Cl.[2] H02P 5/16
U.S. Cl. 318—331 **8 Claims**



1. A system for controlling the rotation speed and phase of a direct current motor comprising:

a direct current motor having an armature resistance;

a rotary structure means driven by said motor;

a differential operational amplifier having two input terminals, one of said input terminals being connected to said direct current motor;

a first resistor connected between an output terminal of said amplifier and said one input terminal;

a second resistor connected between the other input terminal of the amplifier and a terminal for applying a control signal voltage thereto;

a third resistor connected between said output terminal of the amplifier and the other input terminal, said armature resistance and said first, second, and third resistors being connected as essentially a bridge circuit;

means for detecting the rotational phase of said rotary structure and producing a phase detection output signal;

means for supplying a reference signal; and

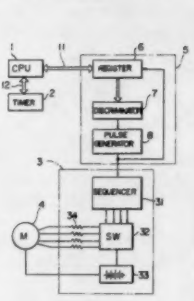
phase comparing means for comparing said phase detection signal and said reference signal and applying the resulting output phase comparison error signal to said control signal voltage terminal.

4,145,643

CONTROL APPARATUS FOR DRIVING A PULSE MOTOR

Yoshio Maeda, and Koichi Matsumoto, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed May 17, 1977, Ser. No. 797,692
Claims priority, application Japan, Sep. 3, 1976, 51-104863
Int. Cl.[2] G05B 19/40
U.S. Cl. 318—696 **10 Claims**



4. A control apparatus for driving a pulse motor which is driven through a pulse motor driver to rotate by a predetermined physical angle with each of driving pulses being applied to the pulse motor driver, said control apparatus comprising:

first means for successively producing timing signals at controlled time intervals,

second means responsive to each of said timing signals to receive and store digital data indicative of the number of driving pulses to be applied to said pulse motor driver during a time interval between said successive timing signals, and

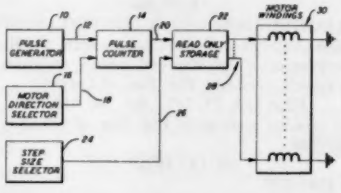
third means for successively producing a selected number of driving pulses at a controlled frequency during said time interval, said selected number being equal to a number corresponding to said stored digital data and said frequency being determined such that said selected number of driving pulses are produced within said time interval.

4,145,644

DUAL STEPPING ANGLE STEPPER MOTOR DRIVE

Raymond C. Liu, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 30, 1977, Ser. No. 811,738
Int. Cl.[2] H02K 37/00
U.S. Cl. 318—696 **15 Claims**



1. A stepping motor control circuit for selectively controlling the size of each step of a controlled stepping motor with a plurality of windings comprising, in combination:

means selectively operable to produce step size indicating signals;

means to produce periodically repeating address signals where the signals change at the desired motor step rate;

read-only-memory means for storing predefined data which is changeable to suit the desired operation for the stepping motor at each of a plurality of addressable locations, said read-only-memory means being responsive to said step

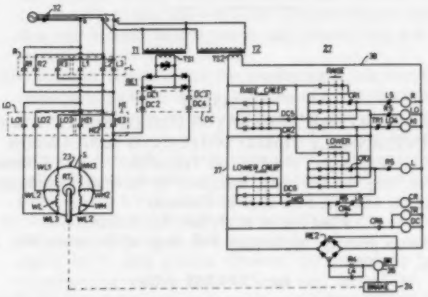
size indicating signals and said address signals to place the predefined data stored at the address defined by said step size indicating signals and said address signals onto the memory output terminals;

motor drive circuit means responsive to the predefined data at said memory output terminals to energize the motor windings specified by said data at said output terminals thus causing the motor to turn by a step whose size is indicated by the step size indicating signals.

4,145,645
SPEED CONTROL MEANS FOR SQUIRREL-CAGE MOTOR

Lester A. Price, Greenfield; Gerold E. Schmid, Brookfield, and Lawrence A. Millonzi, Milwaukee, all of Wis., assignors to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Oct. 13, 1976, Ser. No. 731,926
Int. Cl.[2] H02P *3/24, 7/48*
U.S. Cl. 318—762 **9 Claims**



1. In combination:

an electric motor comprising a rotor and a stator, said stator comprising at least two stator windings, with one stator winding having a greater number of poles than the other stator winding;

an alternating current source;

a direct current source;

and control means for operating said rotor at any one of a multiplicity of different speeds, said control means comprising:

means for energizing said one stator winding from said alternating current source and simultaneously energizing said other stator winding from said direct current source to effect operation of said rotor at a given speed;

means for deenergizing said other stator winding from said direct current source and for energizing said one stator winding from said alternating current source to effect operation of said rotor at an intermediate speed greater than said given speed;

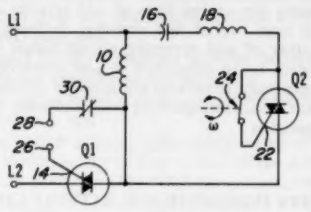
means for deenergizing said one stator winding from said alternating current source and for energizing another stator winding other than said one stator winding from said alternating current source to effect operation of said rotor at a speed greater than said intermediate speed;

and first time delay means to prevent application of alternating current from said alternating current source to any winding previously energized from said direct current source until arcing ceases between said direct current source and said any winding during transition from one rotor speed to another.

4,145,646
START-STOP CIRCUIT FOR SPLIT PHASE MOTOR

Frank J. Werderitch, 120 Tamworth Pl., Schaumburg, Ill. 60172

Continuation of Ser. No. 567,863, Apr. 14, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,723
Int. Cl.[2] H02P *1/44*
U.S. Cl. 318—782 **3 Claims**



1. A solid state start-stop circuit for a split phase alternating current motor having a run winding and a start winding, comprising in combination

a solid state bilateral switching device having a trigger input terminal and a pair of power terminals,

said power terminals being connected in series with said start winding for connection across a source of variable a.c. voltage,

normally closed switch means connected between said trigger input terminal and the connection between said start winding and said source of a.c. voltage, and

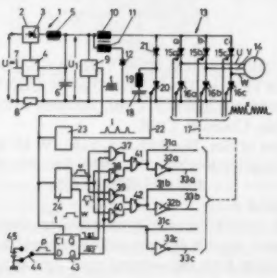
means responsive to the speed of said motor and independent of the voltage level of said source of a.c. voltage for operating said switch means when the speed of said motor exceeds a fixed predetermined value to disconnect said trigger input terminal from said source of a.c. voltage,

whereby said start winding is disconnected from said source of a.c. voltage when said motor reaches said predetermined speed.

4,145,647
ARRANGEMENT FOR CONTROLLING THE SPEED AND ROTARY DIRECTION OF A THREE-PHASE ASYNCHRONOUS MOTOR

Kaj Nielsen, Nordborg, and Nils H. Nygaard, Sonderborg, both of Denmark, assignors to Danfoss A/S, Denmark

Filed Feb. 23, 1978, Ser. No. 880,636
Int. Cl.[2] H02P *5/40*
U.S. Cl. 318—810 **2 Claims**



1. A circuit for controlling the speed and rotary direction of a three-phase asynchronous motor, comprising, controllable DC voltage supply means, means responsive to limiting current for reducing the voltage of said supply means, three-phase inverter means connected to said DC supply means having three branches with a pair of switch elements in series in each of said branches, said inverter means including a common

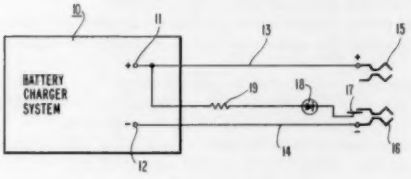
extinguishing switch element in shunt with said three branches, a speed determining frequency generator responsive to the voltage of said DC supply means, an ignition signal generator driven by said frequency generator for operating said inverter switch element, an extinction signal generator driven by said frequency generator for operating said common extinguishing switch element, reversing circuit means between said ignition signal generator and said inverter branches having two states for exchanging the control lines of said inverter switch elements in at least two of said branches, latching means for selecting either of said reversing circuit means states, said latching means being connected to and subservient to said frequency generator to prevent initiations of reversals prior to the operation of said extinguishing switch element during each cycle of operation.

4,145,648

POLARITY INDICATOR FOR BATTERY CHARGER

James P. Zender, Sumter, S.C., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Jun. 27, 1977, Ser. No. 809,979
Int. Cl.[2] H02J 7/00; H01R 11/00
U.S. Cl. 320—25 **8 Claims**



1. In a battery charger having positive and negative output terminals, with positive and negative battery charger cables and clips connected thereto, for connection of the charger to the positive and negative terminals of the battery to be charged, a polarity indicator for indicating to the operator of the battery charger the correct terminals of the battery to be charged, said polarity indicator comprising:

(a) test probe means mounted in conjunction with the second charger clip such that said test probe is electrically insulated from said second charger clip; and

(b) light emitting diode means connected between a first charger clip and the test probe means, so that upon connection of the first charger clip to a first battery terminal and contact of the test probe means with the other battery terminal, the polarity of the terminals is indicated by whether or not said light emitting diode lights up.

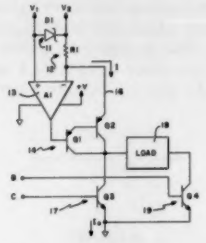
4,145,649

AMPLITUDE INSENSITIVE VOLTAGE-TO-CURRENT CONVERTER AND METHOD FOR CONVERSION

Shailer T. Pickton, Lafayette, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Continuation of Ser. No. 659,213, Feb. 19, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,264
Int. Cl.[2] G05F 1/56
U.S. Cl. 323—4 **22 Claims**

1. A dual current source responsive to alternate first and second control signals for providing current to an electrical load comprising first and second operational amplifiers each having an input and an output, means for providing a voltage reference coupled to each of said inputs, first and second buffer amplifiers coupled between said input and output of each of said first and second operational amplifiers for buffering therebetween and providing respective first and second current output therefrom having the same polarity and connected to opposite side of the electrical load, first and second electronic switches actuated by the first and second control signals respectively connected to opposite sides of said load and operating to pass said first and second current outputs when actuated, first and second means for setting the magnitudes of said first and second current outputs respectively to maintain constant



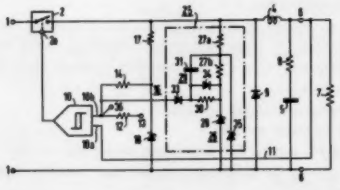
predetermined levels, whereby said predetermined first and second current levels are switched through the electrical load alternately in response to application of the second first control signals respectively.

4,145,650

METHOD AND APPARATUS FOR OPERATING AN INTERNALLY TIMED SWITCHING REGULATOR

Herbert Poppinger, and Gautam Tendulkar, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 6, 1977, Ser. No. 813,285
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633923
Int. Cl.[2] G05F 1/56
U.S. Cl. 323—17 **11 Claims**



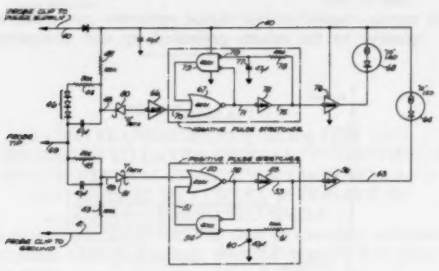
7. In an internally timed switching regulator comprising: a pair of input terminals; a pair of output terminals; a controllable switch and a choke in series coupling said input terminals to said output terminals; a capacitor shunted across said output terminals; a bypass diode shunting the L-C member comprising said capacitor and choke; a limit indicator having its output coupled to the control input of said switch and having an actual voltage input obtained from said output terminals and a reference value input; a terminal coupled to said reference value input; and a first resistor and a first Zener diode in series shunted across said bypass diode, the junction of said first resistor and first Zener diode coupled to said reference value input, the improvement comprising a second series circuit comprising a second resistor and second Zener diode shunted across said bypass diode; and R-C member comprising a capacitor and resistor in series shunted across the second resistor in said second series circuit, the junction point of said resistor and capacitor of said R-C member coupled to the reference input of said limit indicator.

4,145,651

HAND-HELD LOGIC CIRCUIT PROBE

Allen E. Ripingill, Jr., 8825 Revelstoke Way, San Diego, Calif. 92126

Filed Jun. 23, 1977, Ser. No. 809,232
Int. Cl.[2] G01R *31/02, 19/16*
U.S. Cl. 324—72.5 12 Claims



3. A test probe for determining the electrical state of a selected point in a digital circuit, comprising:

a voltage divider connectable across the voltage supply of said digital circuit, a central tap of said divider being connectable to said selected point, said divider also having first and second taps between said central tap and the respective ends of said divider,

first detector circuit means for producing a true output in response to an input thereto in excess of a first signal level, said first detector circuit means being connected to receive an input from said first tap, said first tap being selected so that said certain signal level will be exceeded only when said divider central tap is connected to a circuit point having a voltage above a first threshold,

second detector circuit means for producing a true output in response to an input thereto which is below a second signal level, said second detector circuit means being connected to receive an input from said second tap, said second tap being selected so that said input will be below said second signal level only when said divider central tap is connected to a circuit point having a voltage below a second threshold, and

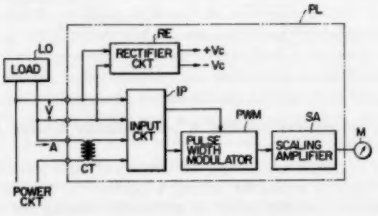
first and second indicator means cooperating with said first and second detector circuit means for indicating respectively when the associated detector circuit means produces a true output.

4,145,652

ELECTRIC POWER TO DC SIGNAL CONVERTER

Eiji Hayashi, Tokyo, Japan, assignor to Kabushikikaishi Yokogawa Denki Seisakusho, Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,504
Claims priority, application Japan, Nov. 12, 1976, 51-136056
Int. Cl.[2] G01R *21/06*
U.S. Cl. 324—142 9 Claims



1. An electric power to d-c signal converter comprising:

a pulse width modulator comprising

an integrator having a d-c amplifier to which a voltage signal from a power circuit is applied through an input resistor, and a feedback capacitor;

a comparator having hysteresis characteristic comprising a first NAND gate of C-MOS connected through a resistance element to the output terminal of said integrator, a second NAND gate of C-MOS connected in series to the first NAND gate, and a feedback resistor connected between the input terminal of the first NAND gate and the output terminal of the second NAND gate; and

a feedback resistor connected between the input terminal of the d-c amplifier of said integrator

and the output terminal of the second NAND gate of said comparator; and

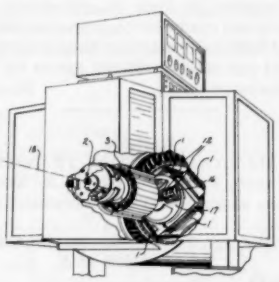
an analog switch driven by the output signal of said pulse width modulator for turning on and off the current signal from said power circuit; a smoothing circuit for smoothing the output of said analog switch; and a rectifier circuit for smoothing the voltage signal from said power circuit and rendering the signal a constant signal, and applying the constant voltage to the d-c amplifier constituting said pulse width modulator, and to the first and second NAND gates as a power voltage, whereby a d-c signal corresponding to the power of said power circuit is obtained from the output terminal of said smoothing circuit.

4,145,653

WAVEFORM ANALYZER FOR ROTATING ELECTRICAL CIRCUITRY

James R. Voigt, Cleveland, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Sep. 16, 1976, Ser. No. 724,087
Int. Cl.[2] G01R *31/02;* G08B *21/00*
U.S. Cl. 324—158 MG 13 Claims



2. In an electrical generator having a shaft which rotates about an axis and a winding mounted on said shaft for generating a periodic voltage which is synchronized with the rotation of said shaft, a monitoring circuit the combination comprising:

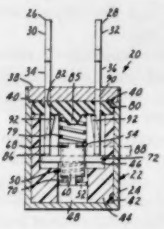
a light source mounted to said shaft to rotate therewith, said light source being disposed radially outward from said axis of rotation and being oriented to direct light along said axis of rotation when energized; and

means connecting said light source to said winding to apply the periodic voltage thereto such that said light source is periodically energized by said applied voltage in synchronism with the rotation of said shaft to generate a circular light pattern about said axis of rotation which is substantially stationary under steady-state operating conditions.

4,145,654
THERMAL SWITCH

Forrest R. Grimm, Golden Valley, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 21, 1977, Ser. No. 817,552
Int. Cl.[2] H01H 37/76
U.S. Cl. 337—407 4 Claims



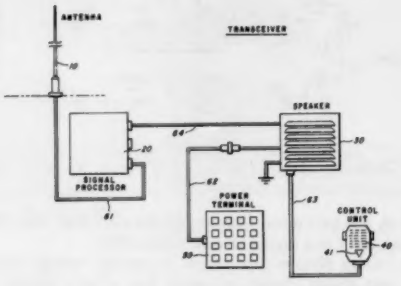
1. A thermal switch comprising:
a housing providing a cavity,
a pair of spaced electrical leads extending into said cavity in parallel through one end of said housing,
a conductor bar within said cavity for contacting the ends of said leads, to make electrical connection therebetween,
a mechanical isolating member surrounding said conductor bar between said leads and having parallel ends perpendicular to said leads, said conductor bar being movable within said isolating member between said parallel ends thereof and said isolating member being movable in said cavity parallel to said electrical leads,
a first compression spring within said isolating member urging said conductor bar toward the end of said isolating member nearest said one end of said cavity,
a second compression spring between said one end of said cavity and said isolating member urging said isolating member toward the end of said cavity opposite said one end, and
a fusible pellet between said isolating member and said opposite end of said cavity normally supporting said isolating member against the force of said second compression spring with said conductor bar contacting the ends of said electrical leads and being supported thereby away from the end of said isolating member against the force of said first compression spring.

4,145,655
DIGITALLY TRANSMITTING TRANSCEIVER

Edward R. Caudel, Dallas, and William R. Wilson, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1977, Ser. No. 791,611
Int. Cl.[2] H04B 1/38
U.S. Cl. 325—15 15 Claims

10. A transceiver comprising:
(a) means for transmitting and receiving analog information signals;
(b) digital code receiving means for receiving digitally-formatted code signals;
(c) digital code transmitting means for transmitting digitally-formatted code signals;
(d) a keyboard device;
(e) digital processor means coupled to said keyboard device and responsive thereto, said digital processor means including:
(i) memory means for storing a digital code entered via said keyboard device;
(ii) input means coupling said digital processor to said digital code receiving means;
(iii) comparator means for comparing code signals received by said digital code receiving means with the code stored in said memory means; and
(iv) output means coupling said digital processor means to said digital code transmitting means, said digital processor means being responsive to selective keyboard actuation for transmitting coded signals entered via said keyboard by means of said digital code transmitting means; and
(f) means coupled to said digital processor means and responsive to the results generated by said comparator

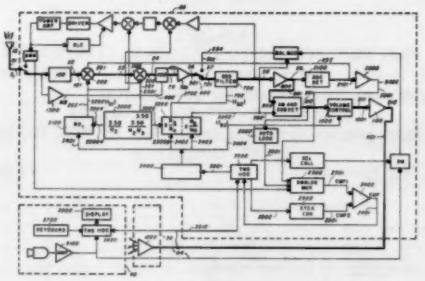


means for activating a preselected portion of said transceiver; wherein
(g) a digital code received by said transceiver which matches a digital code stored in the memory means thereof will activate said predetermined portion of said transceiver; and wherein
(h) said keyboard is activatable for transmitting digital codes via the digital code transmitting means thereof to activate respective predetermined portions of other such transceivers.

4,145,656
TRANSCEIVER CAPABLE OF SENSING A CLEAR CHANNEL

Jerry D. Merryman, Dallas; Michael J. Cochran, Richardson, and Edward R. Caudel, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1977, Ser. No. 791,253
Int. Cl.[2] H04B 1/38
U.S. Cl. 325—25 10 Claims



8. A transceiver capable of automatically sensing a clear channel comprising:
(a) a manually activatable momentary contact switch;
(b) memory means for storing a digital representation of a present channel prior to automatic sensing for a clear channel;
(c) circuit means responsive to the actuation of said momentary contact switch for storing the digital representation of the present channel in said memory means and for

scanning other channels in a preselected sequence in search of a clear channel, said circuit means including a signal level measuring means for determining a clear channel and means for indicating said clear channel; and

(d) means responsive to the deactuation of said momentary contact switch for returning said transceiver to the channel whose digital representation was stored in said memory means.

4,145,657

RADIO TRANSMISSION SYSTEM FOR TWO SUBSCRIBERS TO HAVE A MUTUAL CONNECTION ON ONE OF SEVERAL FREQUENCY CHANNELS AND HAVING TIME MULTIPLEX INTERLACE OF PREFERRED CHANNELS

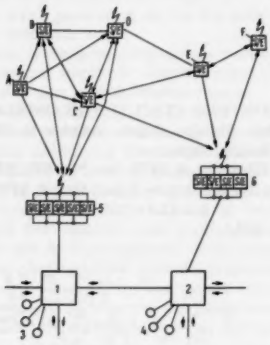
Manfred Hanni, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 494,861, Aug. 7, 1974, abandoned. This application Feb. 22, 1977, Ser. No. 775,459

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1973, 2340136

Int. Cl.[2] H04K *1/00*

U.S. Cl. 325—32 **8 Claims**



1. A radio transmission system in which two subscribers use only one of possibly several frequency channels for a mutual connection, comprising means for regularly interrupting the connection between said subscribers for a short time with respect to the transmitting time, means for establishing a return connection in the manner of a time slot channel having a low transmission capacity in comparison to the actual frequency channel, and means for transmitting information of the return connection by way of the time slot channel, each subscriber having a subscriber station including a transmitting path and a receiving path, a buffer memory connected to said transmitting and receiving paths to time compress outgoing information and time expand incoming information, a crypto device to code outgoing information and decode incoming information, first transfer switch means for selectively connecting said crypto device to said buffer memory and selectively to said transmitting and receiving paths, means storing a program of frequency channels, a transmitter and a receiver connecting said frequency channel program storage means to said transmitting and receiving paths, an antenna, second switch means for selectively connecting said antenna to said transmitter and said receiver, and an address computer connected to said frequency program storage means and adapted to receive subscriber address and interrupt information, and further comprising means for providing a succession of time slots organized as a time multiplex system to interlace the preferred channels.

4,145,658

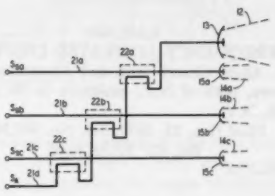
METHOD AND APPARATUS FOR CANCELLING INTERFERENCE BETWEEN AREA COVERAGE AND SPOT COVERAGE ANTENNA BEAMS

Anthony Acampora, Freehold; Douglas O. J. Reudink, Sea Girt, and Yu S. Yeh, Freehold Township, Monmouth County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 3, 1977, Ser. No. 803,151

Int. Cl.[2] H04B *7/04*

U.S. Cl. 325—180 **6 Claims**



1. A method of effecting substantial cancellation of interference between a first and a second signal concurrently transmitted in a first and a second antenna radiated beam, respectively, where the first and second signals include different informational content and use the same frequency spectrum and the first and second beams overlap each other in the area of a receiver desiring to receive only the first signals, the method comprising the step of:

at the transmitter

(a) coupling a predetermined portion of the second signal to be transmitted in the second beam into the signal to be transmitted by the first beam, said predetermined portion of the coupled-in second signal having a magnitude and phase to substantially cancel, after propagation in the first beam to the receiver, the second signal arriving in the second beam at the receiver.

4,145,659

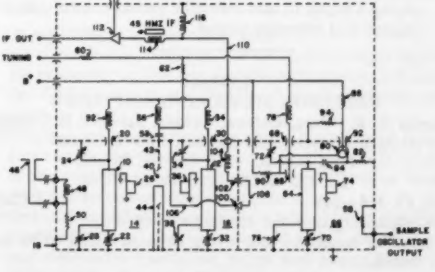
UHF ELECTRONIC TUNER

Adolf E. Wolfram, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed May 25, 1977, Ser. No. 800,422

Int. Cl.[2] H04B *1/26*

U.S. Cl. 325—468 **12 Claims**



1. A UHF varactor tuner comprising:

preselector means for passing a select radio frequency signal, said preselector means including a housing containing resonant cavities, a plurality of transmission lines and a plurality of varactor diodes for providing variable half-wave tuning of said transmission lines, said transmission lines being contained in respective resonant cavities of said housing and being aperture intercoupled by aperture means in the walls of said resonant cavities;

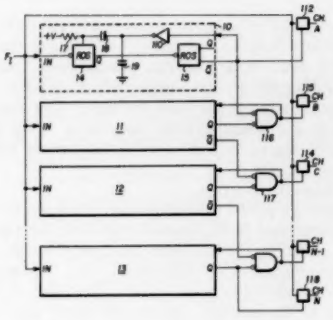
oscillator means for generating an oscillator signal;
mixer means coupled to heterodyne said oscillator signal with said select radio frequency to result in an intermediate frequency signal; and
said preselector means further including frequency dependent circuit means coupled between said tuned transmission lines and operative primarily at one end of the UHF band of frequencies to augment said aperture intercoupling and thereby provide said preselector means with a substantially uniform bandwidth over the entire UHF band.

4,145,660

FREQUENCY ACTIVATED CIRCUIT

Richard W. Allen, Cherry Hill, and Alexander Jackson, III, Moorestown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,906
Int. Cl.[2] H03K *9/06*
U.S. Cl. 328—138 **14 Claims**



1. In a circuit for coupling an input signal to an output means depending on the frequency of the input signal, including means for receiving said input signal, frequency select means, including reference period control means, responsive to said input signal for producing an enabling signal of one level when the period of said input signal is less than a reference period and of another level when the period of said input signal is greater than said reference period, and coupling means responsive to said enabling signal for coupling said input signal to the output means, the improvement comprising:
feedback means responsive to said enabling signal for supplying a signal to said reference period control means to change said reference period.

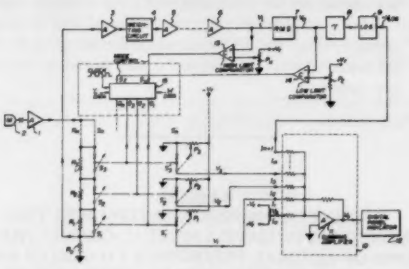
4,145,661

PRECISION MEASURING AMPLIFIER

George S. K. Wong, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 28, 1977, Ser. No. 865,235
Int. Cl.[2] G01R *15/10, 19/02, 17/02*
U.S. Cl. 328—145 **5 Claims**

1. Measuring amplifier apparatus comprising:
amplifier means for amplifying an input signal to be measured;
attenuator means for selectively attenuating the input signal by fixed attenuating steps;
detector means for converting the attenuated input signal to a dc signal representative of the RMS value of the input signal;
logarithmic converter means for converting the dc signal to a logarithmic value;
voltage source means for providing an output signal equivalent to the selected attenuation of the input signal at the logarithmic converter output; and
summing amplifier means for adding the logarithmic converter means output signal and the voltage source means



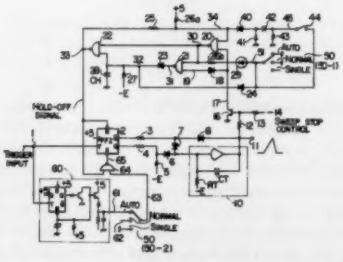
output signal to provide an output signal proportional to the logarithm of the RMS value of the input signal.

4,145,662

SWEEP CONTROL CIRCUIT FOR OSCILLOSCOPE

Kiyoshi Otofuji, Kodaira, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Japan

Filed Oct. 4, 1977, Ser. No. 839,255
Claims priority, application Japan, Oct. 6, 1976, 51-119379
Int. Cl.[2] H03K *4/08*
U.S. Cl. 328—181 **12 Claims**

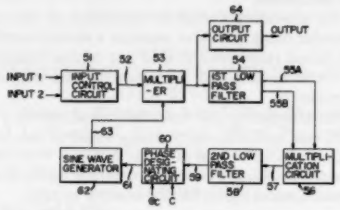


1. A sweep control circuit for an oscilloscope comprising:
a gate circuit means having a hold-off input to which a hold-off signal is applied, a trigger input to which a trigger signal is applied, and a free running control input, said gate circuit means being latched by said trigger signal;
a free running control circuit means connected with said free running control input of said gate circuit means for mask-controlling said hold-off signal applied to said gate circuit means to control a free running at an automatic sweep mode and a ground free running at a normal sweep mode;
a hold-off circuit means for generating said hold-off signal and forming a hold-off time; and
a single reset circuit means for generating a differentiated pulse signal at a single sweep mode to couple the same to said hold-off circuit means, said single reset circuit means including a single reset switch and a chattering preventing circuit for preventing the chattering of said switch.

4,145,663
DIGITAL SYNCHRONOUS DETECTORS USING TIME DIVISION FOR EXTRACTING CARRIER WAVE AND DEMODULATED SIGNALS

Haruki Yahata; Shunsuke Honda, both of Yokohama, and Tadamichi Kawasaki, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 17, 1978, Ser. No. 870,099
Claims priority, application Japan, Jan. 18, 1977, 52-3609
Int. Cl.[2] H03D *1/00, 3/20*
U.S. Cl. 329—50 **6 Claims**



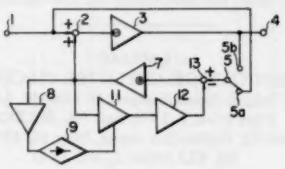
1. A digital synchronous detector comprising:
an input control circuit connected to receive a first input which is a modulated wave from which a carrier wave is to be extracted, and a second input which is said modulated wave, and controlled to produce said first and second inputs on the time division basis;
a reference wave generating circuit for generating a sine wave as a reference wave,
said reference wave generating circuit producing at least first and second amplitude values corresponding to first and second phases of said reference wave;
a time division multiplying circuit coupled to said input control circuit and said reference signal generating circuit for effecting multiplying operations on the time division basis during at least first and second intervals,
said multiplying circuit multiplying said first input with the first amplitude value corresponding to said first phase during said first interval, and multiplying said second input with said second amplitude value corresponding to said second phase which is shifted a predetermined angle from said first phase during said second interval;
an output circuit for deriving out a demodulated signal from the output of said multiplying circuit during said second interval;
means for deriving out a variable control quantity from the output of said multiplying circuit; and
a phase designating circuit coupled to said variable control quantity deriving out means and said reference wave generating circuit for designating said first and second phases of said reference wave,
said phase designating circuit including means for adding a definite value and said variable control quantity to a phase designation value obtained at a preceding sampling time at each sampling time of said modulated wave and
memory means for storing the result of said addition as a new phase designating value so as to give said stored result to said reference wave generating circuit.

4,145,664
AUDIO SIGNAL COMPRESSION AND EXPANSION SYSTEM

Saburo Takaoka; Fumihiko Yokogawa, and Tadahiro Yamaguchi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,356
Claims priority, application Japan, Mar. 31, 1977, 52/36446
Int. Cl.[2] H03G *7/08*
U.S. Cl. 330—85 **3 Claims**

1. In a signal compression and expansion system having a main signal path and an auxiliary signal path connectable therewith in a feedback or feedforward mode, said auxiliary signal path including amplifier means (7); a weighting function amplifier (8) connected to the output of said amplifier means; and a detection circuit (9) connected to the output of said weighting function amplifier; the improvements characterized by:
(a) a voltage-controlled variable gain circuit (11) for amplifying the output of said amplifier means;

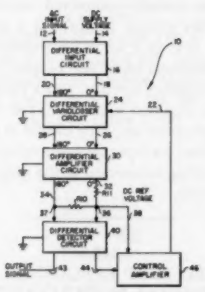


(b) means connecting the output of said detection circuit to a gain-control input of said variable gain circuit;
(c) means (12) for integrating the output of said variable gain circuit; and
(d) means (13) for feeding back said integrated output to the input of said amplifier means.

4,145,665
REGULATING AMPLIFIER

Otto G. Wisotzky, San Francisco, and Tom L. Blackburn, San Jose, both of Calif., assignors to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Feb. 27, 1978, Ser. No. 881,464
Int. Cl.[2] H03G *3/30*
U.S. Cl. 330—254 **17 Claims**



1. A regulating amplifier comprising:
input circuit means responsive to DC and AC input signals for producing on first and second output terminals thereof the DC signal and AC signals of equal amplitude and opposite phase;
differential variolosser means having a pair of input terminals electrically connected to associated output terminals of said input circuit means, having a pair of output terminals, and having an input-control terminal;
differential amplifier means having a pair of input terminals electrically connected to associated output terminals of said differential variolosser means and having a pair of output terminals;
resistive means electrically connected between the output terminals of said differential amplifier means for producing a DC reference voltage at an output terminal of said resistive means and at which the AC output signals of said differential amplifier means cancel;
differential detector means having a first input terminal electrically connected to one output terminal of said differential amplifier means and having a second input terminal electrically connected to the output terminal of said

resistive means, and having an output terminal from which the detected signal is coupled; and

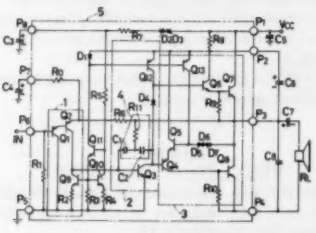
first control means comprising a differential amplifier having first and second input terminals responsive to the DC reference potential and the detected signal, respectively, for producing a control signal which is electrically connected to the control terminal of said differential variolosser means for controlling the loss thereof.

4,145,666

MULTISTAGE AMPLIFIER CIRCUIT

Kunio Seki, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 1, 1978, Ser. No. 882,452
Claims priority, application Japan, May 18, 1977, 52-56407
Int. Cl.[2] H03F *3/183, 3/30*
U.S. Cl. 330—265 **5 Claims**



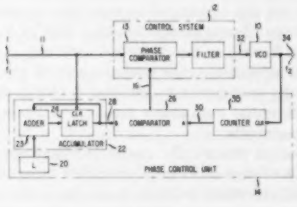
1. In a multistage amplifier circuit having a plurality of amplifier circuits which are connected in cascade, and a negative feedback circuit which constitutes a closed circuit loop together with the cascade-connected amplifier circuits, said multistage amplifier circuit comprising a phase compensator circuit including first and second capacitors which are connected in series between input and output terminals of one of the plurality of amplifier circuits, and a resistor which is connected between a common juncture of the two capacitors and an output terminal of the amplifier circuit at a stage succeeding to said one amplifier, an input terminal of the succeeding-stage amplifier circuit being connected to the output terminal of said one amplifier circuit.

4,145,667

PHASE LOCKED LOOP FREQUENCY SYNTHESIZER USING DIGITAL MODULO ARITHMETIC

David G. Messerschmitt, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 13, 1977, Ser. No. 832,831
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—16 **4 Claims**



1. A frequency synthesizer including

a first terminal adapted for receiving a first frequency signal,

first means responsive to said first frequency signal for extending a synthesized second frequency signal to an output terminal;

said first extending means including a control unit responsive to one of said frequency signals for providing a control signal said control unit including an accumulator, said accumulator including apparatus for adding a first number to an output of said accumulator to obtain a sum, and said first extending means including a control system responsive to said control signal and to the other one of said frequency signals for controlling said second frequency signal and CHARACTERIZED IN THAT said synthesizer comprises:

means for providing a modulo remainder of said sum, said remainder being provided modulo a second number,

second means responsive to said one of said frequency signals for extending said remainder to said output of said accumulator,

means for comparing said extended remainder to a prefixed signal, said prefixed signal being equal to the value of a function of said second number, and

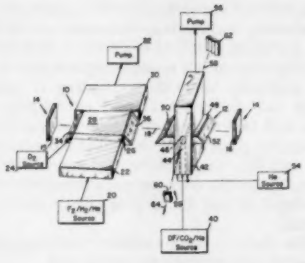
third means responsive to said comparing means for extending said control signal to said control system.

4,145,668

OPTICAL RESONANCE PUMPED TRANSFER LASER WITH HIGH MULTILINE PHOTON-TO-SINGLE-LINE PHOTON CONVERSION EFFICIENCY

Frithjof N. Mastrup, Palos Verdes Peninsula, and John H. S. Wang, Rancho Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 31, 1977, Ser. No. 783,089
Int. Cl.[2] H01S *3/091*
U.S. Cl. 331—94.5 P **7 Claims**



1. A laser comprising:

a first volume of a first gas including diatomic molecules having first laser transitions between different vibrational energy levels;

a first optical resonator disposed about said first volume of said first gas along a first axis through said first volume of said first gas and tuned to selected ones of said first laser transitions;

a second volume of gas disposed within said first optical resonator in optical communication with and separated from said first volume of said first gas, said second volume of gas including a mixture of said first gas and a second gas including polyatomic molecules containing at least three atoms, said polyatomic molecules having second laser transitions from upper energy levels near the upper energy levels of said selected ones of said first laser transitions;

a second optical resonator disposed about said second volume of gas along a second axis through said second volume of gas and tuned to a selected one of said second laser transitions, said second axis being oriented in a predetermined angular relationship relative to said first axis, said second optical resonator including means for abstracting laser energy therefrom; and

means for exciting said diatomic molecules of said first vol-

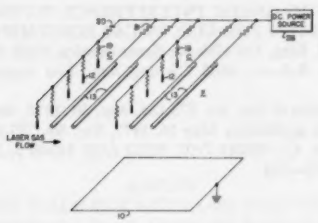
ume of said first gas to a condition of population inversion between the upper and lower energy levels of said selected ones of said first laser transitions to produce multiline laser oscillation in said first optical resonator, the energy from which is absorbed by said diatomic molecules of said first gas in said second volume of gas and collisionally transferred to said polyatomic molecules to produce population inversion between the upper and lower energy levels of said second laser transitions, whereby single-line laser oscillation is obtained in said second optical resonator on said selected one of said second laser transitions.

4,145,669

CATHODE ELECTRODE CONFIGURATION FOR GAS LASER SYSTEM

Richard V. Babcock, Pittsburgh; John L. Pack, Murrysville, and Richard L. Hundstad, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 10, 1977, Ser. No. 767,246
Int. Cl.[2] H01S *3/097*
U.S. Cl. 331—94.5 PE **2 Claims**



1. In a gas laser apparatus including a laser housing containing a flowing laser gas medium, the combination of,

spaced apart cathode and anode electrodes defining a main laser discharge volume therebetween, said anode being a planar electrode, said cathode electrode comprised of rows of cathode elements including a combination of one or more rows each consisting of a plurality of discrete cathode pin elements being perpendicular to said planar anode electrode, and one or more rows, each consisting of a single elongated cathode element, all of said cathode elements being within said main laser discharge volume,

DC excitation means,

ballast means coupling said DC excitation means to said rows of cathode elements, and

optical elements disposed relative to said discharge volume to define a laser optical cavity.

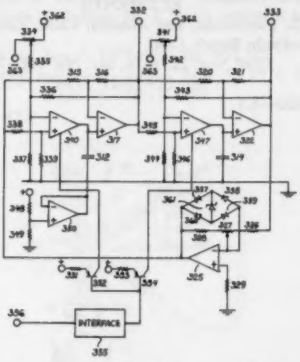
4,145,670

MULTIPHASE SIGNAL OSCILLATOR

Harald E. W. Bode, 1344 Abington Pl., North Tonawanda, N.Y. 14120

Filed Jul. 5, 1977, Ser. No. 812,508
Int. Cl.[2] H03B *5/24*
U.S. Cl. 331—135 **6 Claims**

1. In a quadrature oscillator having a first and a second 90° phase shifting circuits and a unity gain inverter stage connected in a positive feedback loop, the improvement which comprises said 90° phase shifting circuits each having a pair of operational amplifiers, connected in series with each other, means responsive to a control voltage connected to one of said pair of amplifiers for operating said one amplifier as an operational transconductance amplifier which presents a resistance determined by said control voltage, a capacitor connected to the output of said one amplifier so as to obtain said 90° phase shift at the frequency of oscillation of said oscillator, and a resistor connected between the output of the other of said pair



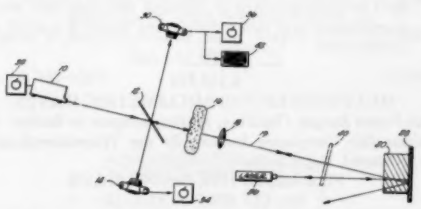
of amplifiers and an input of said one amplifier to provide negative feedback therebetween.

4,145,671

TIME-REVERSED REPLICATION OF A WAVE FRONT

Robert W. Hellwarth, Los Angeles, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Jan. 6, 1978, Ser. No. 867,637
Int. Cl.[2] H01S *3/30*
U.S. Cl. 332—7.51 **21 Claims**



1. An apparatus for replication of an optical image that has passed through a light-scattering medium comprising:

means for generating a substantially monochromatic incident light beam and a pump laser beam;

a homogeneous non-linear medium substantially transparent to said incident light beam;

means for counter-propagating said pump laser beam through said non-linear medium;

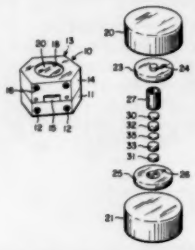
means for directing said incident light beam along a predetermined path into said non-linear medium after having passed through said light-scattering medium whereby to reflect back at least a portion of said incident light beam along a path colinear with said predetermined path, said reflected light being a time-reversed wave front; and

means for isolating said reflected light after said reflected light is passed through said directing means and said light-scattering medium.

4,145,672
MICROWAVE FERRITE CIRCULATOR HAVING DIELECTRIC TUBE FOR HOUSING CIRCULATOR ELEMENTS

Wieslaw S. Piotrowski, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 12, 1976, Ser. No. 741,370
Int. Cl.[2] H01P 1/38
U.S. Cl. 333—1.1 8 Claims



1. A waveguide circulator comprising:

a housing including opposed inner surfaces forming a central region and including at least three waveguide ports;

first and second transformers formed of conductive material and having opposed outside and inside surfaces, said outside surfaces being respectively mounted against said opposed inner surfaces in said central region and said inside surfaces each including securing means;

third and fourth transformers formed of dielectric material;

first and second ferrite elements;

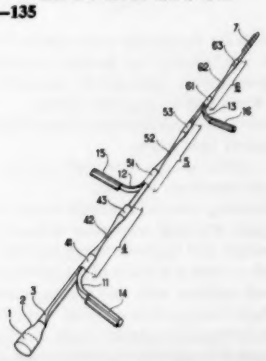
a spacer formed from conductive material, said third and fourth transformers, said first and second ferrite elements and said spacer each having an outer perimeter with a generally similar shape;

an elongated hollow member formed of a dielectric material and having a configuration for carrying said spacer, said third and fourth transformers, and said first and second ferrite elements, said member being disposed between said opposed inside surfaces and secured by said securing means without requiring bonding material, whereby when a signal is applied to a first of said ports and a magnetic field is generated axially through said first and second transformers and said member, the signal is rotated to a second port.

4,145,673
MULTIPLEXER FOR MILLIMETRIC WAVES

Jean-Pierre Boujet, Chatillon, France, assignor to Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 19, 1977, Ser. No. 816,954
Int. Cl.[2] H01P 1/20, 5/12
U.S. Cl. 333—135 5 Claims



1. A millimetric wave multiplexer for separating a hyperfrequency band into n + I sub-bands (n being 2,3, . . .) or vice versa comprising n diplexers in series, each diplexer comprising a semi-circular inlet coupler followed by a semi-circular high-pass filter and by a semi-circular outlet coupler, the filter being dimensioned to reflect only the lowest sub-band which is received by the diplexer in question, wherein the radius R of the inlet coupler of each diplexer and the sub-band reflected by its high-pass filter are chosen in such a manner that:

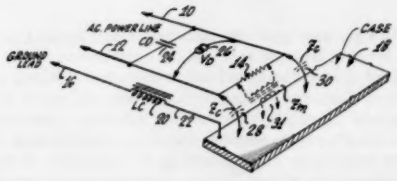
$$\frac{v}{2\pi} \cdot \frac{1}{f\min} \cdot P'_{12} < R < \frac{v}{2\pi} \cdot \frac{l}{f\max} \cdot P'_{22}$$

where v is the speed of light, f min and f max are respectively the lower and the upper limit frequencies of the reflected sub-band and P'_{12} and P'_{22} are the second zeros of the first and second order Bessel functions characterising the respective semi-circular TE_{12} and TE_{22} modes.

4,145,674
ELECTROMAGNETIC INTERFERENCE SUPPRESSION SYSTEM FOR ELECTRICAL EQUIPMENT

William M. King, 510 17th St., Santa Monica, Calif. 90402, and Jack V. Roberts, 6005 Corning Ave., Los Angeles, Calif. 90056

Continuation of Ser. No. 573,136, Apr. 30, 1975, abandoned.
This application May 16, 1977, Ser. No. 797,466
Int. Cl.[2] H03H 7/02; H02J 1/02; H04B 3/28
U.S. Cl. 333—181 6 Claims



1. An electromagnetic interference suppression system for use with electrical equipment having a surrounding case, said case receiving a power cable comprising two alternating current power lines connected for operably energizing said equipment and insulated electrically from said case, and a ground lead connected electrically to said case, said system consisting essentially of:

a capacitor shunting said power lines; and

an inductor connected in series with said ground lead, said inductor formed by a toroidal core through which said ground lead is wound a relatively few number of turns,

said capacitor and said inductor both positioned within said case.

4,145,675
CHARGED-COUPLED DEVICE FILTER

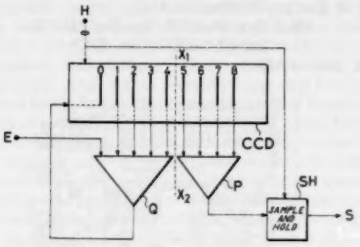
Jean-Edgar Picquendar, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 17, 1977, Ser. No. 807,530
Claims priority, application France, Jun. 22, 1976, 76 18929
Int. Cl.[2] H03H 7/28; H01L 27/10; H03H 7/10; G11C 19/28
U.S. Cl. 333—165 4 Claims

1. A device for filtering an input signal, which comprises:

a charge-coupled device for transferring, under the control of external clock signals, under a plurality of slotted-weight electrodes, charges injected under an entry electrode;

means for adding said input signal, and a signal appearing on one of said electrodes during said transfer to produce a feedback signal; and



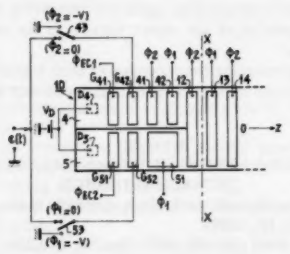
means for adding a plurality of signals appearing on said plurality of electrodes during said transfer to produce an output signal.

4,145,676

INPUT STAGE FOR A CTD LOW-PASS FILTER

Roger Benoit-Gonin; Jean L. Berger, and Sylvain Fontanes, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 19, 1977, Ser. No. 788,779
Claims priority, application France, Apr. 23, 1976, 76 12064
Int. Cl.[2] H03H *7/28;* H01L *27/10;* G11C *19/28;* H01L *29/78*
U.S. Cl. 333—165 6 Claims



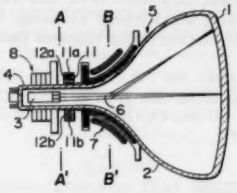
1. An input stage for a CTD low-pass filter, comprising a semiconductor substrate, an insulating layer deposited upon the substrate, said substrate comprising at least two insulated channels, each channel receiving said input signal and comprising sampling means, said sampling means comprising a diode formed in said substrate and two sampling gates, arranged upon said insulating layer, the samples being constituted by electrical charges capable of moving through said substrate, the sampling performed in the first channel exhibiting a phase advance in relation to the sampling performed in the second channel, substantially equal to half the sampling period, said stage further comprising electrodes arranged on each of said channels after said sampling gates, in order to delay the sample formed in the first channel by a time substantially equal to said phase advance, said channels being united by a single summing electrode, extending over the two channels.

4,145,677

COLOR MISALIGNMENT CORRECTION DEVICE FOR COLOR PICTURE TUBE

Koichi Maruyama, Chiba; Kuniharu Osakabe, and Satoshi Kawanishi, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 3, 1977, Ser. No. 803,387
Claims priority, application Japan, Aug. 20, 1976, 51-99249
Int. Cl.[2] H01F *1/00*
U.S. Cl. 335—212 7 Claims



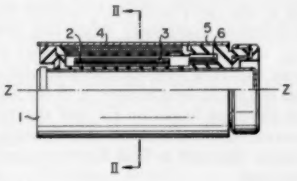
1. In a color picture tube including a cathode-ray bulb having a panel portion, a funnel portion and a neck portion, electron guns housed within the neck portion of said bulb for emitting three electron beams toward the inner surface of the panel portion of said bulb, and a deflection coil assembly disposed on the outer peripheral surface of the funnel portion of said bulb for deflecting said electron beams, a device for correcting color misalignment comprising permanent magnet means disposed on the outer peripheral surface of said cathode-ray bulb in the region defined between the emitting end of said electron guns and the center of deflection of said deflection coil assembly for providing a non-varying magnetic field acting to cause rotating movement of said electron beams around the axis of the neck portion of said bulb in a predetermined direction to reduce arc-shaped convergence errors at the peripheral areas of the panel.

4,145,678

PICKUP TUBE STRUCTURE WITH AN IMPROVED MAGNETIC SHIELD

Toru Takikawa, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 21, 1978, Ser. No. 879,747
Claims priority, application Japan, May 9, 1977, 52-52029
Int. Cl.[2] H01F *1/00*
U.S. Cl. 335—214 2 Claims



1. A pickup tube structure comprising an image pickup tube and a yoke assembly mounted on the image pickup tube, the image pickup tube including beam producing means, the yoke assembly including beam focusing and deflecting means and a magnetic shield means for suppressing undesirable effect of external magnetic field on the electron beam within the tube, the magnetic shield means being made of a plate of a high permeability material shaped in a cylindrical form with an almost linear joint portion, in which the direction of the linear joint portion of the cylindrical shield means is almost parallel with the axis of the image pickup tube and the angle between the plane including the linear joint portion of the cylindrical shield means and the axis of the image pickup tube and the

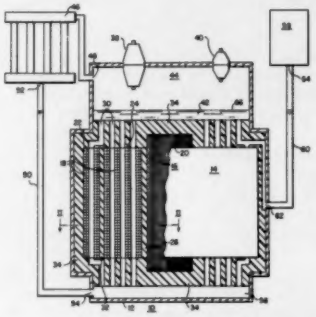
plane including the direction of the magnetic field for the horizontal deflection of the electron beam and the axis of the image pickup tube is not smaller than about −30° and is not larger than about +30°.

4,145,679

VAPORIZATION COOLED AND INSULATED ELECTRICAL INDUCTIVE APPARATUS

George F. Mitchell, Jr., Hickory Township, Mercer County, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 771,142, Feb. 23, 1977, abandoned. This application May 9, 1978, Ser. No. 904,159
Int. Cl.[2] H01F *27/10*
U.S. Cl. 336—57 6 Claims



1. An electrical inductive apparatus, comprising:

a case having electrical bushings, said electrical bushings including encased terminals and external terminals;

an electrical winding, subject to temperature changes while energized, disposed in inductive relation with a magnetic core ddisposed in said case;

alectric leads disposed in said case and operative to connect said electrical winding to the encased terminals of said selectrical bushings;

a liquid dielectric vaporizable within the normal operating temperature range of said electrical winding disposed in said case whereby cooling of said electrical winding is effected by the vaporization of said liquid dielectric; said liquid dielectric completely immersing said electrical winding, said encased terminals and said electric leads when said electrical winding is de-energized and substantially all of said liquid dielectric is in the liquid phase to provide electrical insulation for said electrical winding, said encased terminals and said electric leads;

storage means disposed in fluid flow communication with said case; and

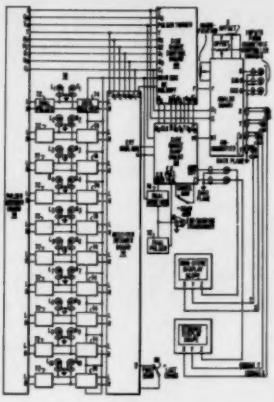
transfer means responsive to a predetermined parameter in said case, associated with the vaporization of said liqid dielectric for transferring a portion of said liquid dielectric from said case to said storage means, said electric leads and encased terminals being alternately immersed in said liquid dielectric and exposed in response to changes in the predetermined parameter, while said electrical winding is constantly immersed in said liquid dielectric, with vapor in the space formed around said encased terminals and electric leads when said liquid dielectric is transferred to the storage means, maintaining a constant level of dielectric strength for said enclosed terminals and electric leads as the liquid is removed, without having a non-condensable gas.

4,145,680

ACOUSTIC IMAGING SYSTEM

Richard W. Smith, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 18, 1977, Ser. No. 843,182
Int. Cl.[2] G01S *9/66, 7/62*
U.S. Cl. 340—5 MP 7 Claims



1. An acoustic imaging system for displaying a viewed object comprising:

a laterally extending array of a plurality of acoustic transducers respectively spaced at a known distance from a given point and directed to transmit and receive acoustic signals along preestablished transmission paths substantially parallel to a preselected plane;

means for pivoting the array within the preselected plane about the given point;

means for activating the transducers along the array to transmit and receive acoustic signals;

means for generating output voltages for each respective reception of an acoustic signal corresponding to the coordinate position of the object viewed as the array is pivoted; and

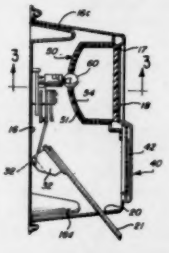
means for presenting the reception of each transducer on the same display at its corresponding coordinate position.

4,145,681

VEHICLE PARKING GUIDE AND ELECTRICAL SIGNALING DEVICE

Frank J. Bubnich, and Marketta A. Bubnich, both of 3224 Emmaus, Zion, Ill. 60099

Filed Oct. 14, 1977, Ser. No. 842,228
Int. Cl.[2] G08G *1/14*
U.S. Cl. 340—51 1 Claim



1. A vehicle parking guide and signaling device comprising

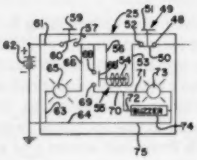
a housing section adapted to be supported in a vertical position on a backing plate in a parking area and having a front wall with an opening therein, said opening being closed by a pane of light transmitting material adapted to support indicia on the surface thereof, means supported on said backing plate and extending into said housing section comprising an electrical circuit with a light bulb and resilient switch means normally in closed position, said resilient switch means having a switch actuating means, lever means pivotally supported between the ends thereof by the housing section in an opening formed in the lower wall of said housing section, said lever means having on the upper end a biasing weight with a bearing surface which normally engages said switch actuating means and holds said resilient switch means in open position, reflector means supported within said housing section which in combination with said light bulb is adapted to provide an intense beam of light on the inner surface of said pane when said circuit is closed, and said lever means being movable out of contact with the said switch actuating means by the bumper of a vehicle to allow said switch means to close said electrical circuit; whereby an intense beam of light illuminates the inner surface of said pane when said lever means is pivotally moved rearwardly by the bumper of a vehicle as said vehicle moves into a designated position into a parking area.

4,145,682

SEMI-DUMP TRUCK LEVEL INDICATOR

John Cook, Dundas, Canada, assignor to Pullman Incorporated, Chicago, Ill.

Filed Feb. 4, 1976, Ser. No. 655,299
Int. Cl.[2] B60Q 5/00; G08B 21/00
U.S. Cl. 340—52 H **9 Claims**



1. In a dump vehicle, a safety device to signal excessive lateral tilt thereof with danger of tipping over the vehicle upon raising of the dump box thereon;

said device comprising first and second gravity actuated serially-coupled normally closed sensing switches adapted for mounting on the vehicle,

said switches each having a first connection means coupled to each other,

an electromotive power source having first and second connecting means,

said first of said sensing switches having a second connection means coupled to a first connecting means of said electromotive power source,

each sensing switch being responsive to a predetermined lateral inclination of the vehicle to open the switch,

said second sensing switch having a second connection means,

a warning system comprising a relay-operated normally closed power switch including a solenoid coil having one end coupled to said second connection means of said second sensing switch,

means coupling said coil at a second end to a second connecting means on said power source for completing a circuit from the power source through said coil and through said sensing switches to said second connection means of the first sensing switch for energizing the coil to maintain said power switch in open position attendant to said sensing switches being closed and the connections between the coil and sensing switches and between the sensing switches and said first connecting means being complete, and

alarm means adapted to be coupled through said power switch to said second connecting means and coupled to said first connecting means,

whereby, upon the flow of current being interrupted through said coil said power switch is free to close the circuit through said alarm,

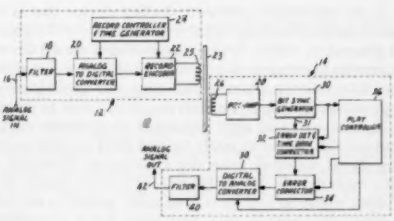
and said switches being vertically spaced and mounted respectively above and below a predetermined substantially horizontal axis extending transversely of the vehicle intermediate horizontal planes of the hinge axis of the dump box and the axis of the rear wheel and axle assembly of the vehicle and in substantially vertical alignment with each other and generally centered on substantially the vertical longitudinal center plane of the vehicle.

4,145,683

SINGLE TRACK AUDIO-DIGITAL RECORDER AND CIRCUIT FOR USE THEREIN HAVING ERROR CORRECTION

Marshall R. Brookhart, Newbury Park, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 2, 1977, Ser. No. 847,923
Int. Cl.[2] G06F 11/12
U.S. Cl. 340—146.1 F **21 Claims**



1. A circuit for processing audio signals to be digitized and recorded on a single track of a suitable record medium, said circuit comprising

(a) means for converting an input analog audio signal into a corresponding digitized audio signal, and

(b) means for encoding said digitized audio signal into a serialized signal suitable for recording on said record medium, said serialized signal containing a succession of frames in which each frame comprises a preselected number of data words, a preselected number of parity words, an error check code word corresponding to the frame and a sync word defining the frame location, said encoding means including means for generating the parity words of each frame by an exclusive OR combination of data words of at least two other preselected frames according to the expression

$$P_K^N = D_{K+j}^{(N+n)} \oplus D_{K+k}^{(N+m)}$$

where

P_K^N is a given parity word located at segment K of frame N,

$D_{K+j}^{(N+n)}$ is a given data word located at segment K+j of another preselected frame N+n, where j is an integer,

$D_{K+k}^{(N+m)}$ is a given data word located at segment K+k of yet another preselected frame N+m,

where K is an integer, k is an integer, and m and n are integers not equal to each other or to 0, whereby each frame which is incorrectly played back may be detected, correct data words of that frame may be reconstructed from the data words of at least one of said other preselected frames in combination with the parity words generated from the data words of that frame,

and the corrected data words may be inserted into a serialized play-back signal in place of the data words of the incorrectly played back frame.

4,145,684

ALERTING SYSTEM WITH DUAL-ADDRESS MEMORY

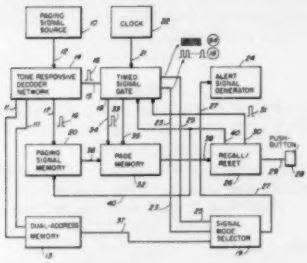
Thomas R. Stodolski, Cambridge, Mass., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 28, 1976, Ser. No. 690,854

The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.[2] H04M *11/02*

U.S. Cl. 340—311 **9 Claims**



1. In an electrically-operated alerting device that is responsive to a received calling signal to initiate an input signal for an alert generator, which device also includes means for supplying electrical energy to the device, an alert generator for providing alternatively a signal indicating the application of said energy to said device or an alert signal to a user in response to said input signal, said alert generator comprising: alert signal output means; means to apply to said alert generator an energizing signal resulting from the application of power to said device immediately on application of power; means to apply said input signal to said alert generator; means to set said alert generator alternatively in a first state for a prescribed time interval in which it can report during only that time interval an application of power to said device or in a second state in which it can report a received calling signal event, means responsive to said energizing signal when said alert generator is in said first state to drive said output means in a first mode which audibly indicates the application of power to said device; and means responsive to said input signal when said generator is in said second state to drive said output means in a second mode audibly distinguishable from the first mode and which indicates a received calling signal.

4,145,685

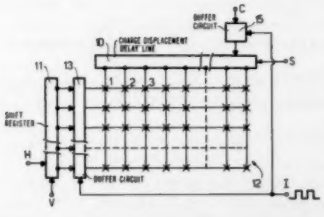
IMAGE DISPLAY DEVICES

Attilio Farina, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Turin, Italy

Filed Aug. 9, 1977, Ser. No. 823,240

Int. Cl.[2] H01J *17/48*

U.S. Cl. 340—782 **10 Claims**



1. An image display device, comprising a plurality of elements which can be made luminous, arranged in a matrix formed by rows and columns, in which each column of the matrix is piloted by as many outputs of a single delay line of the charge displacement type, which delay line is fed by a video signal representative, for lines, of the image to be reproduced, and by a clock signal, the delay of said line being substantially equal to the effective duration of information in one line of said video signal, and there being provided means for interrupting the passage of the clock signal to said delay line for a time which substantially corresponds to the line blanking interval of said video signal, so that during said time the status of the charges in said delay line remains unchanged, said unchanged charge status being utilized to render luminous a row of said elements.

4,145,686

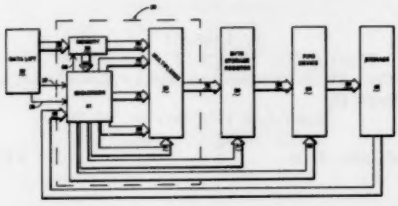
DATA COMPRESSOR

Robert D. McMurray, Midlothian, and James R. Hicks, Darbyshire, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Jun. 27, 1977, Ser. No. 810,252

Int. Cl.[2] H03K *13/00*

U.S. Cl. 340—347 DD **19 Claims**



1. Data compressor for compressing a stream of digital signals, said stream including trains of serially redundant signals and a primary signal frequently occurring in said stream comprising; a memory means receiving and storing said signals serially; a sequencer in communication with said memory means, said sequencer means including means for eliminating said primary signals from said stream and substituting an address within said stream to the next signal other than said primary signal therefor, and means for eliminating from said stream said trains of redundant signals leaving one digital signal of each of said trains and substituting a count of number of redundant signals of each train therefor.

4,145,687

KEYBOARD SWITCH CIRCUIT FOR USE IN A MATRIX WHICH HAS A SERIES CIRCUIT INCLUDING A RELUCTANCE ELEMENT AND A DIODE CONNECTED BETWEEN EACH ROW AND COLUMN OF THE MATRIX

Noboru Masuda, Kawaguchi, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

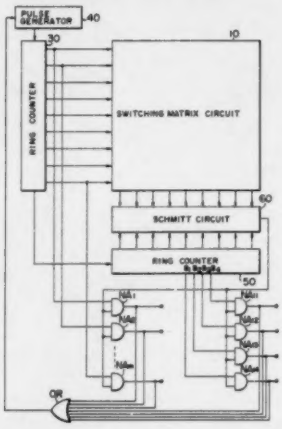
Filed Sep. 30, 1975, Ser. No. 618,155

Int. Cl.[2] G06F *3/02*

U.S. Cl. 340—365 S **16 Claims**

1. A keyboard switch circuit comprising a switch matrix circuit including m rows and n columns where m and n represent positive integers, each of the rows and columns being individually associated with a lead terminal, the switch matrix circuit further including n . m series circuits each comprising a diode and a reluctance element, each of the series circuits being connected across a particular one of the rows and a particular one of the columns so as to correspond to a particular key switch, each key switch including magnetic means for generating a flux density, all of the diodes being poled to conduct forwardly from the rows toward the columns or vice versa, the reluctance elements being constructed such that the flux density applied thereto is varied by actuation of a corresponding key switch to thereby vary the resistance presented by the

element; a first circuit means for sequentially applying pulses to the lead terminals which are associated with either rows or columns; and second circuit means responsive to pulses appearing on the columns or rows for producing a pulse output, the second circuit means comprising a Schmitt trigger circuit connected with the lead terminals which are connected to the cathode of the diode in the switch matrix circuit, the Schmitt



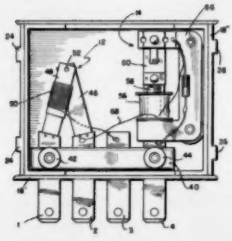
trigger circuit having a plurality of first stage transistors each having its base connected to one of the lead terminals, and a common second stage transistor connected to the emitters of the first transistors and connected to ground through a common emitter resistance means, whereby when a particular key switch is operated, a corresponding key signal is produced by the second circuit means.

4,145,688

LOW COST BUZZER

Louis P. Sweany, Carmel, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed May 31, 1977, Ser. No. 801,526
Int. Cl.[2] G01K *1/08;* G08B *3/00*
U.S. Cl. 340—391 **7 Claims**



1. A buzzer alarm comprising:

(a) a housing fabricated of an electrically insulative material,

(b) a terminal block carried in said housing along a first wall thereof,

(c) at least four electrical terminals carried by said terminal block and extending out said first wall,

(d) a thermal timing means carried by two of said electrical terminals to be in electrical contact therewith,

(e) a U-shaped frame carried in said housing along a second wall complementary to said first wall,

(f) a reed-coil type buzzer means carried within said U-shaped frame,

(g) lead wires electrically connecting said reed-coil type buzzer means to the other two of said electrical terminals, and

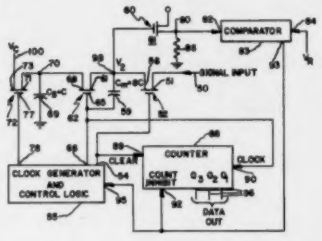
(h) a vibratable diaphragm having a striking area carried by said housing and in working relation to said reed-coil type buzzer means.

4,145,689

A/D CONVERTER

Walter J. Butler, and Charles M. Puckette, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 628,542, Nov. 3, 1975, abandoned. This application Nov. 21, 1977, Ser. No. 853,115
Int. Cl.[2] H03K *13/20*
U.S. Cl. 340—347 AD **2 Claims**



1. A monolithic discrete-charge-packet transfer analog to digital converter comprising:

a semiconductor substrate having an insulative layer on at least a portion of a major surface thereof;

an electrode positioned on the insulative layer to form a region in the underlying substrate for storing and maintaining a quantity of electrical charge of a first polarity;

first means for filling said storing region to a preselected level of charge prior to each conversion of an analog signal;

second means selectively actuated after cessation of operation of said first means for directly connecting said analog signal to said electrode to remove charge of said first polarity from said storing region, the amount of charge removed being proportional to the instantaneous value of the analog signal when said second means is actuated;

third means enabled after operation of the second means for transferring a plurality of packets each containing essentially equal increments of electrical charge of said first polarity into said storing region;

means for counting each of said plurality of essentially equal increments; and

means for detecting the presence of said preselected level of charge in said semiconductor storing region.

4,145,690

CIPHERING DEVICE IMPROVING THE SECRECY OF THE ENCODED REPLIES OF A SECONDARY RADAR

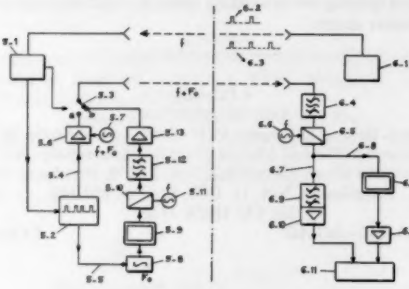
Christian H. Petitjean, Fontenay-aux Roses; Maurice E. Marchand, Sevran, and Marcel Denis, Paris, all of France, assignors to Le Materiel Telephonique, Boulogne-Billancourt, France

Filed Aug. 8, 1977, Ser. No. 822,636
Claims priority, application France, Aug. 12, 1976, 76 24616
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.5 R **3 Claims**

1. In a secondary radar system of the type that includes at least one central station and at least one mobile transponder, an improved ciphering apparatus which comprises:

enciphering means associated with said mobile transponder for overlapping adjacent data pulses in the data train sent

in response to an interrogating signal from said central station; and



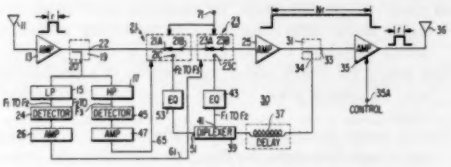
deciphering means associated with said central station for separating the overlapped pulses received from said mobile transponder into separately decoded data pulses.

4,145,691

RF BURST SIGNAL RECIRCULATION MEMORY SYSTEM HAVING A DIPLEXED FEEDBACK LOOP

Marvin R. Freeling, Montclair, and Herbert J. Wolkstein, Livingston, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 207,459, Dec. 13, 1971, abandoned.
This application Mar. 6, 1978, Ser. No. 883,819
Int. Cl.[2] G01S *7/38, 9/02*; H04K *3/00*
U.S. Cl. 343—7 AG **8 Claims**



6. A system for recirculating received radio frequency burst signals where the expected frequency of said signals may vary over a relatively wide range of frequencies and said received signals have a predetermined duration comprising:

a recirculation loop including an amplifier, a delay line and a diplexer, the electrical length of said recirculation loop being fixed such that said loop has a fixed recirculation period substantially equal to the predetermined duration of said received signals,

said diplexer having an input arm and a pair of output arms, said diplexer responsive to said burst signals at said input arm for providing at a first output arm only signals within a first frequency band of said wide range of frequencies and at a second output arm only signals within a second higher frequency band of said wide range of frequencies,

switching means coupled in said recirculation loop between said first and second output arm of said diplexer and said amplifier for recirculating signals at only a selected one of said two frequency bands through said loop,

input means for coupling said burst signals to said recirculation loop,

means coupled to said input means for sensing signals within one of said two frequency bands associated with said input burst signals,

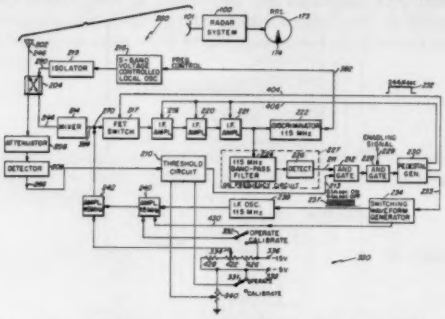
said switching means being coupled to said sensing means and responsive to said sensed signals of said two frequency bands for recirculating the burst signals of said one of said two frequency bands through said recirculation loop and decoupling said loop from said input means whereby said burst signals are recirculated in said loop independent of said received burst signals.

4,145,692

RADAR PERFORMANCE MONITOR

David G. Armstrong, Sudbury; William J. Bickford, Weston; Ronald K. VanderKruik, Arlington, and John T. Zimmer, Harvard, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 9, 1977, Ser. No. 776,080
Int. Cl.[2] G01S *7/22, 7/40*
U.S. Cl. 343—17.7 **10 Claims**



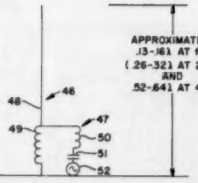
1. A radar performance monitor adapted to be mounted near a radar antenna so as to couple to the radar in space, comprising means for receiving a radio frequency sample being coupled to a detector to produce a detected sample, said monitor being adapted to generate a response signal at the frequency of the transmitter of said radar in response to said detected sample being above a predetermined threshold level, means for transmitting said response signal back to said radar antenna, said response signal producing during operational use of the radar a distinctive test pattern, readily distinguishable from normal radar target returns, upon the display of said radar as long as said radar maintains a predetermined level of sensitivity to signals at the transmitted frequency.

4,145,693

THREE BAND MONOPOLE ANTENNA

Richard C. Fenwick, Dallas, Tex., assignor to Electrospace Systems, Inc., Richardson, Tex.

Filed Mar. 17, 1977, Ser. No. 778,510
Int. Cl.[2] H01Q *1/00, 9/00, 1/50*
U.S. Cl. 343—722 **5 Claims**



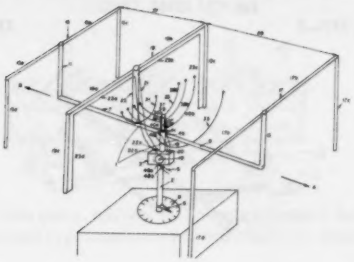
1. In a three band monopole antenna comprising a radiating element and a base matching network; said base matching network comprising a shunt inductor coil interconnecting a voltage potential reference source and said radiating element and a series connection of an inductor coil, a capacitor and a signal source feedpoint; said series connector being electrically connected to said radiating element and said reference source wherein the electrical length of the antenna radiating structure is greater than a quarter wavelength on the the two highest frequency bands and shorter than a quarter wavelength on the lowest frequency band with a length in the approximate range of 0.13 to 0.16 wavelength of the lowest frequency band; and the discrete operational frequency transmitter bands are narrow band and are related in frequency by substantially the progression 1, 2, 4.

2. The three band monpole antenna of claim 1, wherein a top loading disc is mounted on the end of said radiating element remote from the signal source feedpoint.

4,145,694
COMPACT, DIRECTIVE, BROADBAND ANTENNA SYSTEM HAVING END LOADED DIPOLES

Carlyle J. Sletten, 106 Nagog Hill Rd., Acton, Mass. 01720

Filed Aug. 1, 1977, Ser. No. 820,620
Int. Cl.[2] H01Q *21/00, 9/44*
U.S. Cl. 343—727 4 Claims

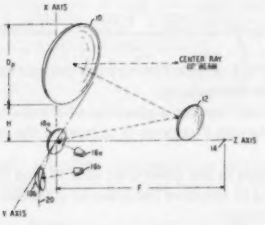


1. A shortened multiband antenna comprising: a support mast, a horizontally polarized electrically center fed first dipole supported on said mast, and first and second end loading elements in the approximate shape of an inverted W symmetrically connected to opposite ends of said dipole in parallel planes orthogonal thereto.

4,145,695
LAUNCHER REFLECTORS FOR CORRECTING FOR ASTIGMATISM IN OFF-AXIS FED REFLECTOR ANTENNAS

Michael J. Gans, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 1, 1977, Ser. No. 773,185
Int. Cl.[2] H01Q *19/14, 19/10*
U.S. Cl. 343—779 4 Claims



2. A launcher reflector for use in a reflecting antenna system, which includes a main reflector, and a feedhorn, for correcting for astigmatism in a beam which is either one of radiated towards and received from a particular direction, the launcher reflector comprising a radius of curvature in two orthogonal planes according to the relationships

$$R_{s\parallel} = \frac{2}{\cos\theta_i}\left(\frac{R_{2C}R_r}{R_r - R_{2C}}\right) \text{and}$$

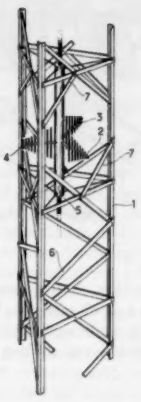
$$R_{s\perp} = 2\cos\theta_i\left(\frac{R_{1C}R_r}{R_r - R_{1C}}\right)$$

where $R_{s\parallel}$ is the radius of curvature of the launcher reflector in the plane of incidence, $R_{s\perp}$ is the radius of curvature of the launcher reflector perpendicular to the plane of incidence, R_r is the radius of curvature of the beam propagating between the feedhorn and the launcher reflector in the area adjacent to the launcher reflector, θ_i is the angle of incidence, and R_{2C} and R_{1C} are the radii of phase front curvature in and perpendicular to the plane of incidence, respectively, with respect to electromagnetic waves propagating along the feed axis of the beam between the main reflector and the launcher reflector in the area adjacent to the launcher reflector.

4,145,696
BROAD BAND, OMNIDIRECTIONAL UHF, VHF ANTENNA

Michel Gueguen, Lannion, France, assignor to Societe Lannionnaise d'Electronique Sle-Citerel, Lannion, France

Filed Dec. 27, 1976, Ser. No. 754,241
Claims priority, application France, Jan. 12, 1976, 76 00559
Int. Cl.[2] H01Q *11/10, 21/20, 1/12*
U.S. Cl. 343—792.5 4 Claims



1. An omnidirectional, wide-band antenna for installation at some intermediate point on a supporting mast, said antenna comprising a single array of three identical log-periodic alignments of vertical dipoles, fed in-phase and disposed at 120° to each other.

4,145,697
GRAPHIC RECORDING APPARATUS WITH STYLUS ADDRESSING BY SHIFT REGISTERS

Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 28, 1977, Ser. No. 865,230
Int. Cl.[2] G01D *9/12, 15/06*
U.S. Cl. 346—35 5 Claims

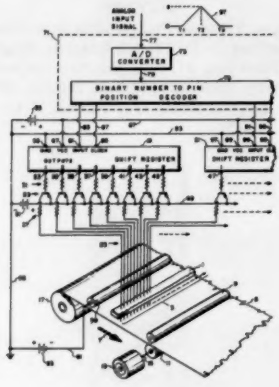
1. In graphic recording apparatus including a record medium which is moved along a travel path relative to a plurality of marking elements which lie along an element path that is substantially normal to said travel path, each of said elements operating to record a corresponding mark on said medium after a time period following the time at which that elements is addressed, the improved means for addressing said elements to cause said marks to form a recorded trace on said medium which represents an applied input signal, comprising

serial-in, parallel-out shift register means having serial input connections and having parallel output connections, each of the latter corresponding to a one of said elements,

logic means connected to receive said input signal and responsive to the value thereof to produce on output means a plurality of binary bit trains wherein the order of the bits of said trains corresponds to the order of the positons of said elements along said element path and the values of said bits collectively represent the value of said input signal in terms of said element positions,

connecting means connected between said output means and said serial input connections to cause said logic means to serially shift said trains into said shift register means, and

an individual connection connecting each of said output connections to a corresponding one of said elements to cause each of said elements to be addressed when the loaded bit on the corresponding one of said output connections has a predetermined value,



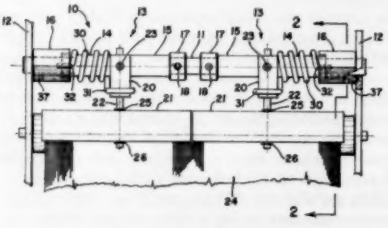
said logic means serially shifting said trains into said shift register means at a clock rate which prevents the shifting bits from causing addressed elements to produce said marks while said bits are shifting to their final loaded positions.

4,145,698

THERMAL PRINTHEAD BIASING ARRANGEMENT

Robert D. Wysong, Boca Raton, Fla., assignor to Shakespeare Marine Electronics, Inc., Miami, Fla.

Filed Dec. 7, 1977, Ser. No. 858,117
Int. Cl.[2] G01D *15/16*; B41J *3/20*
U.S. Cl. 346—139 R **12 Claims**



1. A device for biasing at least one stationary printhead into uniform, tangential contact with the printing media comprising:

a housing;

a shaft supported by said housing;

means rotatable about said shaft for support of said printhead; and

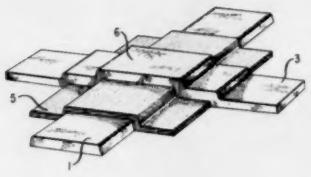
biasing means for maintaining adequate torsion on said means for support thereby establishing and maintaining uniform, tangential contact with the printing media.

4,145,699

SUPERCONDUCTING JUNCTIONS UTILIZING A BINARY SEMICONDUCTOR BARRIER

Evelyn L. Hu, Somerset, and Lawrence D. Jackel, Morganville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 858,389, Dec. 7, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 888,330
Int. Cl.[2] H01L *39/22*
U.S. Cl. 357—5 **11 Claims**



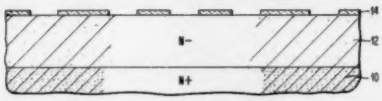
1. A Josephson junction comprising a semiconductor barrier material in intimate contact with two superconducting electrodes CHARACTERIZED IN THAT said semiconductor barrier material comprises a binary composition of Ge and Sn.

4,145,700

POWER FIELD EFFECT TRANSISTORS

Chakrapani G. Jambotkar, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 750,053, Dec. 13, 1976, Pat. No. 4,055,884. This application Aug. 8, 1977, Ser. No. 822,588
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **9 Claims**



1. A MOSFET device having high current and high voltage characteristics comprising:

an N substrate having a plurality of P regions therein;

N regions in said P regions in at least in the inner area of the device;

said P regions in the outermost area of said device are unbiased so as to improve the drain-to-substrate reverse breakdown voltage;

said P regions being arranged in pairs in the said inner area of the device;

an insulated gate contact above peripheries of said pairs and said N regions in said pairs contacted as the sources of said device; and

means for connection the said N substrate as the common drain for said device which includes a contact to the side of said device opposite to the side having said N and P regions.

4,145,701

SEMICONDUCTOR DEVICE

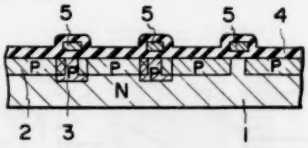
Hiroto Kawagoe, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Continuation of Ser. No. 611,891, Sep. 10, 1975, abandoned. This application Aug. 18, 1978, Ser. No. 934,886
Claims priority, application Japan, Sep. 11, 1974, 49/103927
Int. Cl.[2] H01L *27/10*
U.S. Cl. 357—45 **6 Claims**

1. A semiconductor integrated circuit device comprising:

a plurality of insulated gate field-effect transistors each hav-

ing source and drain regions of a first conductivity type disposed in a substrate of a second conductivity type, opposite said first conductivity type, and a gate electrode overlying a region between the source and drain regions, said plurality of transistors being arranged in the form of a matrix of rows and columns of transistors, the transistors of each row being connected in series through their source



and drain paths, wherein said plurality includes both enhancement type transistors and depletion type transistors, and

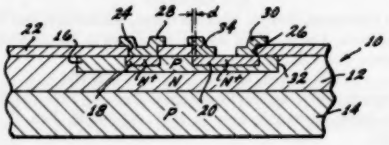
a plurality of wirings corresponding to said columns of transistors, the gate electrodes of transistors of each column being connected in common to the corresponding wiring.

4,145,702

ELECTRICALLY PROGRAMMABLE READ-ONLY-MEMORY DEVICE

John W. Rau, III, Escondido; Harold H. Muller, Carlsbad; Richard K. W. Tam, Poway, all of Calif., and Louis J. Kabell, Reno, Nev., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 5, 1977, Ser. No. 813,001
Int. Cl.[2] H01L *67/10, 23/56*
U.S. Cl. 357—45 **5 Claims**



1. A permanently alterable semiconductor device comprising a body of semiconductor material having a PN junction therein,

a first conductor forming a first terminal electrically contacting said body on one side of said junction,

a second conductor forming a second terminal electrically contacting said body on the other side of said junction,

free metal electrically contacting said body and positioned between said first and second terminals but out of contact with the latter,

an insulating layer on said body,

two semiconductor regions of a first conductivity type beneath said insulating layer and physically separated from each other by a semiconductor region of a second conductivity type, said first and second terminals, respectively, contacting said two semiconductor regions of a first conductivity type, said free metal contacting one of said two regions of said first conductivity type,

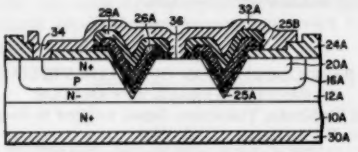
said first conductivity type region being formed by a washed emitter process which forms a window in said insulating layer which has an edge near said PN junction so that the free metal overlying said edge minimizes the distance between the free metal where it contacts said semiconductor region of first conductivity type and said PN junction for localizing heat for fusing said PN junction when said semiconductor device is permanently altered by the appliction of selected current.

4,145,703

HIGH POWER MOS DEVICE AND FABRICATION METHOD THEREFOR

Richard A. Blanchard, Sunnyvale, and Benedict C. K. Choy, Campbell, both of Calif., assignors to Supertex, Inc., Sunnyvale, Calif.

Filed Apr. 15, 1977, Ser. No. 787,788
Int. Cl.[2] H01L *29/06*
U.S. Cl. 357—55 **14 Claims**



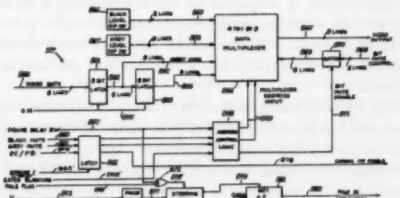
1. A high power MOS semiconductor device comprising, in combination, a semiconductor substrate, spaced source and drain regions of one conductivity type located in said semiconductor substrate, substantially V-shaped channel region having a region thereof of opposite conductivity type connected to said source region and to said drain region and providing a groove in said semiconductor substrate, a first insulating layer located in said groove in said semiconductor substrate and on said substantially V-shaped channel region, a doped electrically conductive polysilicon gate electrode layer located in said groove and on said first insulating layer, a second insulating layer located on and covering said polysilicon gate electrode layer, a first electrode electrically connected to one of said source and drain regions, and a second electrode electrically connected to the other of said source and drain regions, one of said first and second electrodes being located on said second insulating layer and covering substantially the entire surface area over one surface of said semiconductor substrate.

4,145,704

TELEVISION SUBCARRIER PHASE CORRECTION FOR COLOR FIELD SEQUENCING

Luigi C. Gallo, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 28, 1977, Ser. No. 763,942
Int. Cl.[2] H04N *5/79, 9/02*
U.S. Cl. 358—8 **12 Claims**



1. Apparatus for producing a full color frame sequence of color video information in a manner whereby a continuous nonjittering video image can be displayed by repeatedly reproducing one picture frame of video information signal recorded on recording media, and wherein said video information signal has been converted to at least one digital data stream having a predetermined data rate that is an odd multiple of the chrominance subcarrier of said video information signal and said

digital data stream has been recorded on and is being reproduced from said recording media, said data stream being clocked through a transmission channel using a continuous phase clock operating substantially at said predetermined data rate, said apparatus comprising:

means for identifying between alternate video picture frames and producing a signal identifying said alternate picture frames;

means responsive to said picture frame identifying signal for delaying the video data of alternate picture frames for an interval equal to one-half cycle of the continuous phase clock; and

means for reclocking the alternate picture frames of undelayed and delayed video data.

4,145,705
TIME BASE CORRECTION OF COLOR VIDEO SIGNAL FROM PLAYBACK APPARATUS

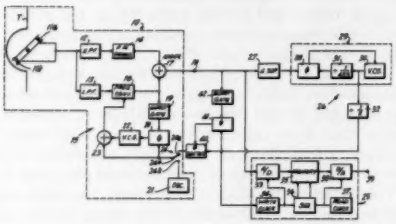
Tadaaki Yoshinaka, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1977, Ser. No. 838,865

Claims priority, application Japan, Oct. 8, 1976, 51-120965

Int. Cl.[2] H04N *5/76, 9/46*

U.S. Cl. 358—8 **14 Claims**



1. The combination of:

a playback apparatus for reproducing a composite color video signal from a recorded signal of the "color-under" type including luminance and chrominance components and a horizontal synchronizing signal and being recorded with said chrominance component down-converted from a standard sub-carrier frequency to a relatively low frequency band below that in which the luminance component is recorded, said playback apparatus including heterodyne means in which said down-converted chrominance component of the recorded signal is frequency reconverted in response to the application of a carrier reference signal to said heterodyne means for providing the chrominance component of the reproduced composite color video signal with said standard sub-carrier frequency;

means for generating said carrier reference signal in response to said horizontal synchronizing signal of the reproduced composite color video signal;

time base correcting means receiving said reproduced composite color video signal and said carrier reference signal as a clock signal and being operative to compensate for time-base errors in said reproduced composite color video signal from said playback apparatus;

variable phase-shifting means for applying said carrier reference signal to said heterodyne means;

means for deriving a color burst signal from said reproduced composite color video signal; and

phase-comparing means for comparing said carrier reference signal with said color burst signal and providing a corresponding control signal to said variable phase-shifting means for determining the phase of said carrier reference signal applied to said heterodyne means.

4,145,706
VIDEO DISPLAY

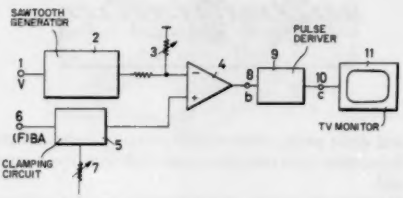
Heinz Hess, Weiterstadt, and Horst Peth, Alsbach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,462

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638858

Int. Cl.[2] H04N *9/62, 7/02, 7/18;* **G01R** *13/22*

U.S. Cl. 358—10 **13 Claims**



1. A circuit arrangement for visually representing a horizontal frequency coupled input signal upon the picture screen of a video display device, comprising means for generating a vertical frequency sawtooth signal, means for comparing the input signal with the sawtooth signal so as to produce as output a further signal identifying the moments when the input and sawtooth signals are equal, and a video display device coupled to the output of the comparing means in such manner that the brightness of the picture screen of the display device is controlled by the further signal.

4,145,707
SEMICONDUCTOR LUMINESCENT DISPLAY APPARATUS

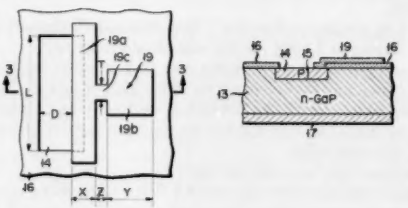
Tetsuo Sadamasa, Tokyo; Makoto Naito, Kamakura, and Tadao Nakamura, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 6, 1977, Ser. No. 803,984

Claims priority, application Japan, Jun. 4, 1976, 51-65212; Jun. 4, 1976, 51-65213; Feb. 3, 1977, 52-10290; Feb. 7, 1977, 52-12222

Int. Cl.[2] H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—68 **7 Claims**

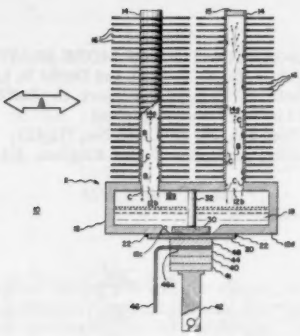


1. A semiconductor luminescent display apparatus comprising a semiconductor substrate of one conductivity type, a luminescent element having a diffusion layer of the opposite conductivity type to emit a light from one surface of said diffusion layer and an electrode for said element, the electrode having an elongated contact portion in contact with one end portion of said surface of said diffusion layer, a lead take-out portion and restricting means electrically connected between said contact portion and lead take-out portion and serving to restrict a flow of impurity from said contact portion to said take-out portion.

4,145,708
POWER MODULE WITH ISOLATED SUBSTRATES COOLED BY INTEGRAL HEAT-ENERGY-REMOVAL MEANS

Armand P. Ferro; John D. Harnden, Jr., both of Schenectady, and Michael H. McLaughlin, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,734
Int. Cl.[2] H01L *25/04*
U.S. Cl. 357—82 12 Claims

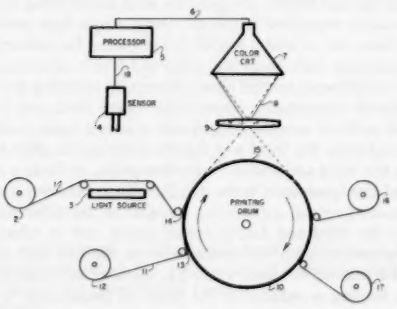


1. A cooled semiconductor power module comprising:
a thermosiphon including a hollow block of heat-conductive material with a coolant fluid contained therein and further including an external surface from which heat energy applied thereto is conducted to vaporize a portion of said coolant fluid;
a substrate of heat-conductive, electrically-insulative material including first and second opposed surfaces, said first surface being bonded to said external surface, and
at least one semiconductor device including at least two electrodes, at least one of said electrodes being bonded to said second surface of said substrate.

4,145,709
AUTOMATIC LOCALIZED MICRO-CONTRAST CONTROL FOR PHOTOGRAPHIC PRINTING SYSTEMS

Michael J. Kelly, 6307 MacArthur Blvd., Brookmont, Md. 20016

Filed Sep. 19, 1977, Ser. No. 834,197
Int. Cl.[2] H04N *5/84*
U.S. Cl. 358—6 9 Claims

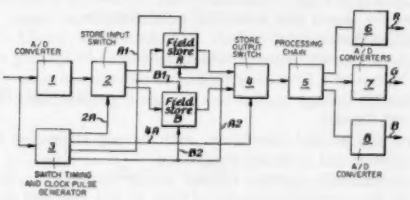


1. A method for exposing with automatic localized micro-contrast control a negative image having incremental areas on a photographic raw stock comprising the steps of:
a. prescanning the incremental areas of the negative image with a high resolution sensor means resulting in a plurality of analog sensor signals corresponding to the intensity of the image at each incremental area;
b. processing the analog sensor signals by separating the signals into amplitude ranges;
c. illuminating a CRT having a color gun by directing the signals from the amplitude ranges to signal generators which are connected to the color gun of the CRT thereby providing a corresponding light output, said signal generators providing signals to said CRT which create light color responsive to the contrast desired from the photographic raw stock; and
d. applying the light output through the corresponding incremental area of the negative image to the photographic raw stock thereby exposing the raw stock to an automatic localized micro-contrast controlled negative image.

4,145,710
METHOD AND APPARATUS FOR DIGITALLY RECORDING TELEVISION IMAGES ON FILM

Ronald J. Venis, Sevenoaks, England, assignor to Colour Video Services, France

Filed Sep. 19, 1977, Ser. No. 834,821
Int. Cl.[2] H04N *5/84*
U.S. Cl. 358—7 6 Claims



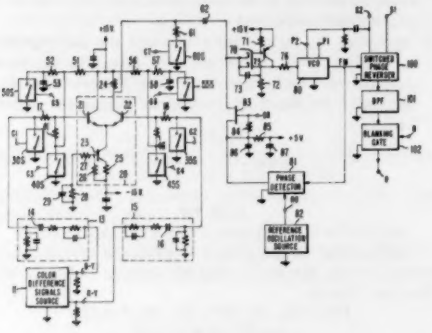
1. A method of recording sequences of successive television images on cine film including the steps of passing an analogue television signal which drives a recorder display to an analogue-to-digital converter to convert the analogue signal to a digital signal comprising a chain of 'bits' representative of a television picture, passing the 'bits' into a sequentially stepping storage device having a capacity equivalent to a complete television picture under the control of timing pulses having a predetermined frequency, to fill the storage device with said 'bits,' applying to the storage device further timing pulses having a frequency different from the predetermined frequency of the first mentioned timing pulses, to empty the storage device at a faster rate from that required to fill the storage device, to reduce the duration of each frame at the output of the storage device with consequent increase in the blanking interval to a value such as to accommodate an intermittently actuated pull down mechanism of a film camera viewing said recorder display.

6. A method for recording television images on film comprising the steps of:
(a) converting an analog television signal to a digital signal comprising a chain of 'bits' representative of a television picture;
(b) storing the 'bits' in a storage device, having the capacity to store a complete television picture, under the control of a timing signal having a predetermined frequency;
(c) emptying the storage device at a faster rate than it was filled under the control of a timing signal having a frequency greater than the predetermined frequency;
(d) converting the signal from the storage device back to an analog form suitable for film recording; and,
(e) recording the converted analog signal on film.

4,145,711
SECAM MODULATOR

Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Nov. 15, 1977, Ser. No. 851,780
Claims priority, application United Kingdom, Nov. 15, 1976, 47549/76
Int. Cl.[2] H04N 9/34, 9/40, 9/42
U.S. Cl. 358—14 21 Claims



1. Apparatus for forming a color television signal of the SECAM type from correlated signals inclusive of a first color-difference signal and a second color-difference signal, said apparatus including:

a controlled oscillator providing an output comprising oscillations of a frequency subject to variation in accordance with a voltage applied to a modulating signal input terminal thereof;

first and second transistors, each having respective base, emitter and collector electrodes;

a substantially constant current source coupled in common to the emitter electrodes of both of said first and second transistors;

a load impedance coupled to the collector electrode of said second transistor;

first switch means for selectively enabling and disabling the application of said first color-difference signal to said base electrode of said first transistor;

second switch means for selectively enabling and disabling the application of said second color-difference signal to said base electrode of said second transistor;

third switch means for controlling the magnitude of a bias potential applied to said base electrode of said first transistor;

fourth switch means for controlling the magnitude of a bias potential applied to said base electrode of said second transistor;

first switch control means coupled to said first and second switch means for causing the enablement of said first color-difference signal application only during alternate ones of a succession of line scanning intervals, and the enablement of said second-color-difference signal application only during line scanning intervals intervening between said alternate ones;

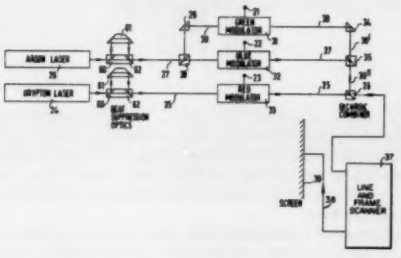
second switch control means coupled to said third and fourth switch means for causing the bias potential magnitude applied to the base electrode of one of said first and second transistors to exceed the bias potential magnitude applied to the base electrode of the other of said first and second transistors during said alternate ones of said succession of line scanning intervals, and for causing the bias potential magnitude applied to the base electrode of said other transistor to exceed the bias potential magnitude applied to said one transistor during said intervening ones of said succession of line scanning intervals; and

means for causing the voltage applied to the modulating signal input terminal of said controlled oscillator to follow variations in the voltage drop across said load impedance.

4,145,712
LASER-ELIMINATION OF MODE BEATING

Archer M. Spooner, South Nutfield, and Daniel R. Lobb, Farnborough, both of England, assignors to Redifon Flight Simulation Limited, Crawley, England

Filed Feb. 28, 1977, Ser. No. 772,423
Claims priority, application United Kingdom, Jul. 22, 1976, 30557/76
Int. Cl.[2] H04N 9/31
U.S. Cl. 358—60 8 Claims



1. A laser system comprising a laser beam source and an optical system for transmitting the laser beam and comprising a beam splitter for splitting the incident laser beam into two approximately equal components, optical means for directing the two components along optical paths of unequal lengths and a beam combiner for combining the two components, after travel along their unequal length paths, to form a single emergent laser beam, in which the said optical system for transmitting the laser beam comprises a first beam splitter for splitting the incident laser beam into first and second approximately equal components, first optical means for directing the first and second components respectively along first and second optical paths of unequal lengths and a first beam combiner for combining the first and second components, after travel along the first and second respective paths, to form a single first emergent laser beam and at least a second beam splitter for splitting the first emergent laser beam into third and fourth approximately equal components, second optical means for directing the third and fourth components respectively along third and fourth optical paths of unequal lengths and a second beam combiner for combining the third and fourth components, after travel along the third and fourth respective paths, to form a single second emergent laser beam, the difference between the first and second optical paths being unequal to the difference between the third and fourth optical paths, and in which the interferometric path difference between the first and second paths is selected to have a value L1, whereby the effect of laser mode beating is reduced at the series of frequencies "f," defined by the expression:

$$f = nC/2L1,$$

where

n is any positive integer,

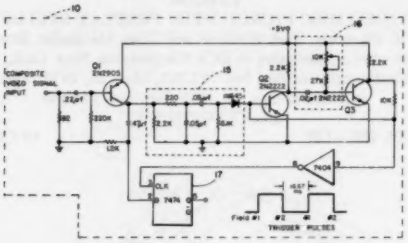
C is the velocity of light, and

L1 is the selected path difference above defined.

4,145,713
COMPOSITE VIDEO SIGNAL FIELD RECOGNITION CIRCUIT

Robert E. White, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1977, Ser. No. 828,809
Int. Cl.[2] H04N 9/58
U.S. Cl. 358—92 5 Claims



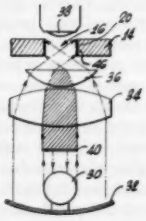
1. In a system having a device for viewing left and right stereoscopic images of composite video signals on a console, an improvement therefor is provided comprising:

means connected to the viewing device and coupled to receive the composite video signals for deriving separate positive logical one and negative logical zero triggering signals from horizontal synchronization pulses of one field and the sequential other field of the composite video signals respectively, and for actuating the viewing device with the separate positive logical one and negative logical zero triggering signals to provide the left and right stereoscopic images in synchronization with the field rate of the composite video signals.

4,145,714
TELEVISION FLAW DETECTOR FOR INSPECTING THE WALL SURFACE OF A HOLE THROUGH A CIRCUIT BOARD

Robert W. MacDonald, San Fernando, and Robert W. Yates, Woodland Hills, both of Calif., assignors to Robert W. MacDonald, San Fernando, Calif.

Filed Feb. 27, 1978, Ser. No. 881,652
Int. Cl.[2] H04N 7/18; G01N 21/32; G02B 21/10
U.S. Cl. 358—106 8 Claims



1. In combination, a circuit board and a television flaw detector for inspecting the wall surface of a hole through the circuit board, the combination comprising,

a support,

a microscope connected to said support, said support supporting the circuit board with the hole axially aligned with the optical axis of the microscope, said microscope producing an image of a region of the wall surface extending around the complete circumference of the hole at a selected axial position therealong,

a television camera connected to said microscrope for viewing the image produced thereby to produce electrical signals which will produce an image on a television monitor corresponding to the image produced by said microscope,

a television monitor electrically connected to said television camera,

a light source emitting light rays, connected to said support in spaced relation from the circuit board on an opposite side thereof from said microscope;

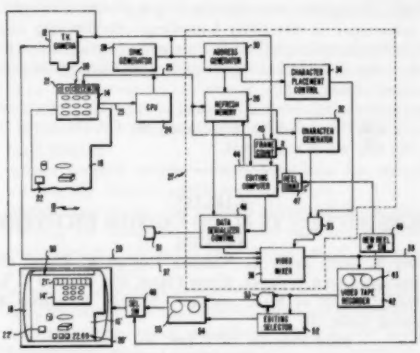
optical condenser means connected to said support positioned between said light source and the circuit board in axial alignment with the hole therein for directing a divergent, generally conical beam of light into the hole to illuminate the wall surface of the hole about its entire circumference and throughout its axial length; and

a mask connected to said condenser means for preventing light rays from said source not reflected from the wall surface of the hole from passing directly into the microscope.

4,145,715
SURVEILLANCE SYSTEM

Eric C. Clever, 29 Estaugh Ave., Haddonfield, N.J. 08033

Filed Dec. 22, 1976, Ser. No. 753,588
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—108 10 Claims



1. A surveillance system for transaction stations comprising:

a television camera for developing frames of video signals representative of transactions performed by a human operator at a transaction station;

means including at least one operator-controlled device for developing digital electronic signals representing data entered by said operator at said transaction station about said transactions concurrently with the development of said video frames;

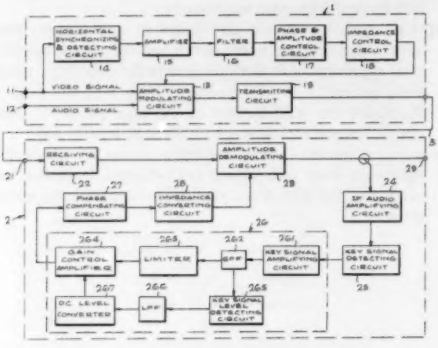
a video display device for visually displaying image frames of said transactions corresponding to and from associated frames of composite signals;

and means for generating a set of video character signals from said digital data signals of each of said transactions and for forming each of said frames of composite signals from one of said frames of video signals and a set of said character signals of the same transaction in a certain relation so that the associated character images are positioned on said display device in a certain location with relation to the associated image frames of said transaction.

4,145,716
DESCRAMBLING DEVICE IN CATV SYSTEM

Hiroki Uemura, and Yoshifumi Saeki, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 22, 1977, Ser. No. 790,146
Claims priority, application Japan, Apr. 23, 1976, 51-46342
Int. Cl.[2] H04N *7/16*
U.S. Cl. 358—118 11 Claims



8. A CATV descrambling device comprising:

a key signal detecting circuit connected to receive at least a component of a CATV signal that has been scrambled by amplitude modulation by a scrambling key signal at a known frequency and to generate a noisy key signal in response thereto;

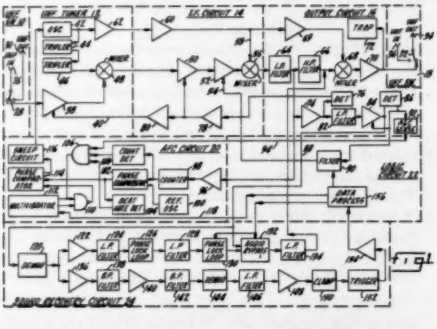
a limiting circuit connected to generate a square wave signal at the known frequency in response to the noisy key signal, the square wave signal having a phase and magnitude responsive to the noisy key signal, the limiting circuit further including a filter connected to provide a sine wave key signal at the known frequency by filtering the square wave signal; and

a demodulating circuit connected to receive and descramble the CATV signal by modulating the CATV signal with the sine wave key signal.

4,145,717
SUBSCRIPTION TV AUDIO CARRIER RECOVERY SYSTEM

Stanley E. Guif; Terry L. Nimmer; Donald A. Weigt, all of Madison; Glenn Wolenec, Cross Plains, and Richard C. Gall, Middleton, all of Wis., assignors to Oak Industries Inc., Crustal Lake, Ill.

Filed May 11, 1977, Ser. No. 795,725
Int. Cl.[2] H04N *1/44*
U.S. Cl. 358—121 11 Claims

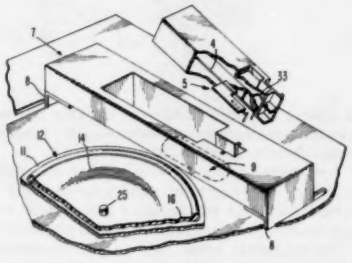


1. A TV decoder for processing TV audio and video signals in which the audio information is received on an audio subcarrier including filter means for separating audio carrier information and video carrier information signals, demodulating means for separating the audio carrier information signal from the audio information subcarrier, means for multiplying the audio information subcarrier to raise it to the frequency of the audio carrier information signal and means for recombining the video carrier information signal with the increased frequency audio information subcarrier.

4,145,718
VIDEO DISC PICKUP WITH PREPLAY STYLUS

Anil R. Dholakia, East Windsor, and John Alexander, Beverly, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 781,301, Mar. 25, 1977. This application Sep. 11, 1978, Ser. No. 941,135
Int. Cl.[2] G11B *3/80*
U.S. Cl. 358—128 19 Claims



1. Playback apparatus for use with a high density information record, such as a video disc or the like, having a spiral groove formed on a major surface thereof, which groove includes an information track; said apparatus comprising:

(A) a playback stylus including an elongated rigid element tapering to a tip at one end thereof, which tip is dimensioned for reception within said groove;

(B) a preplay stylus separate from said playback stylus and including an elongated rigid element tapering to a tip at one end thereof, which tip is provided with a plurality of projecting regions respectively dimensioned for reception within adjacent regions of said groove; said elongated rigid elements being fabricated from materials having comparable rigidity;

(C) a turntable for supporting such a disc record;

(D) means for supporting said playback stylus and said preplay stylus in playing positions permitting entry of said playback stylus tip and said preplay stylus projecting regions into said record groove to a depth, wherein said respective tip and projecting regions engage respective portions of said record groove; said supporting means including further means for providing sufficient independence of motion in the vertical direction between said styli such that disturbances in the vertical position of said preplay stylus during playback due to surface conditions in said record groove have substantially little effect on the vertical position of said playback stylus; said supporting means providing a substantially fixed lateral spacing between said styli; and

(E) turntable rotating means for establishing relative motion between said disc groove and said styli in said playing positions to permit recovery of said information by said playback stylus;

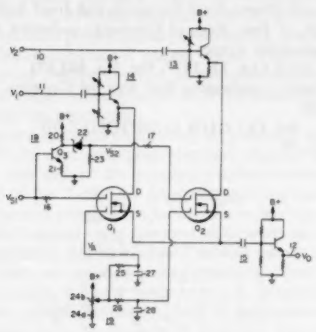
wherein said preplay stylus permits removal of dust and debris from said groove prior to arrival of said playback stylus; and

wherein simultaneous engagement of said pre-play stylus with several groove convolutions aids proper radial tracking by said playback stylus.

4,145,719
MULTI-CHANNEL VIDEO SWITCH USING DUAL-GATE MOS-FETS

Wilfred L. Hand, Clarence, and Craig W. Brun, Honeoye Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 28, 1977, Ser. No. 837,315
Int. Cl.[2] H04N *5/22;* H03K *17/56, 3/353*
U.S. Cl. 358—183 1 Claim



1. A video signal switching circuit for alternately coupling first and second video signal paths to a third video signal path in response to a high-frequency, a switching signal means for generating a square-wave switching signal having a lower switching voltage level and a higher switching voltage level comprising:

first and second dual-gate metal oxide semiconductor field effect transistors, each of said transistors having first and second gate terminals and having a source-drain path with a first and second terminal;

said first terminals of source-drain paths of said first and second dual-gate transistors respectively coupled to said first and second video signal paths;

said second terminals of said source-drain paths of said dual-gate transistors coupled to each other and to said third video path;

said first gate terminal of said first dual-gate transistor coupled to said switching signal means;

voltage potential means coupled to each of said second gates of said dual-gate transistors;

a switching signal phase inversion means coupled to said switching signal means; and

said first gate terminal of said second dual-gate transistor coupled to said switching signal phase inversion means wherein said switching signal phase inversion means comprises:

a three terminal transistor with base terminal connected directly to said switching signal;

an emitter resistor with a terminal connected to the emitter terminal of said three-terminal transistor and with another terminal connected to a zero voltage reference;

a collector resistor of equal resistive value to said emitter resistor with a terminal connected to the collector terminal of said three-terminal transistor and with another terminal connected to a voltage potential equal to at least twice said higher voltage level;

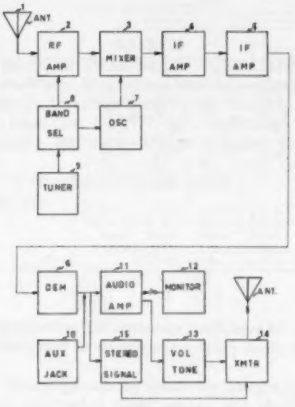
a zener diode having a breakdown voltage substantially equal to the value of said voltage potential less the sum of said lower switching voltage level and said higher switching voltage level with cathode terminal of said diode also connected to said collector terminal of said three-terminal transistor and with anode terminal of said diode connected to said first gate terminal of said second dual-gate transistor; and

a zener-conduction resistor having one terminal also connected to said anode terminal of said diode and having another terminal connected to said zero voltage reference.

4,145,720
REMOTE CONTROL

Morton Weintraub, 1542 47th St.; Elliot Waxman, 1825 50th St., and Bernard Gendelman, 1340 52nd St., all of Brooklyn, N.Y. 11219

Continuation of Ser. No. 707,855, Jul. 22, 1976, abandoned. This application May 19, 1978, Ser. No. 911,162
Int. Cl.[2] H04N *5/44*
U.S. Cl. 358—194 9 Claims



1. Remote television channel selection and plural function control apparatus comprising:

a. A tuner for receiving a composite television signal including luminance, chrominance and audio information modulated on a carrier on any one of a plurality of channels;

b. a demodulator connected to said tuner for providing said luminance, chrominance and audio information in a baseband format;

c. means located at said control apparatus for manually varying the channel selection of the tuner,

d. means located at said control apparatus for manually varying the characteristics of the baseband luminance, chrominance and audio information as a function of viewer preference,

e. means for remodulating and transmitting electromagnetically the composite television signal to a remotely located television receiver on an unused channel via wireless transmission; and,

f. the remote control of both tuning and other receiver functions being effected without direct connection or modification to the receiver.

4,145,721
PHOTOSENSITIVE SELF SCAN ARRAY WITH NOISE REDUCTION

Pierre L. Beaudouin, Dammarie les Lys, and Pierre Debord, Vence, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

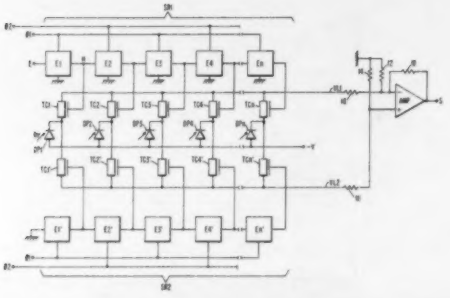
Filed Jan. 31, 1977, Ser. No. 764,100
Claims priority, application France, Jun. 24, 1976, 76 19832
Int. Cl.[2] H04N *3/14;* H01L *27/14;* H03B *1/00*
U.S. Cl. 358—213 5 Claims

1. A photosensitive self scan system comprising

an array of photosensitive elements producing video signals,

first and second pluralities of switching elements, each element of each of said pluralities of switching elements being coupled to a respective one of said photosensitive elements,

a summing device having first and second input terminals,
a first video line coupling each element of said first plurality of switching elements to said first input terminal,
a second video line coupling each element of said second plurality of switching elements to said second input terminal,
first shift register means for producing control signals and first clock pulse noise signals, said control signals being coupled to said first plurality of switching elements for sequentially applying said video signals from said array of photosensitive elements to said first video line and said first clock pulse noise signals being coupled to said first



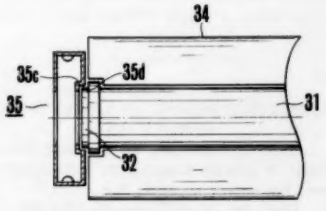
plurality of switching elements for periodically applying said first clock pulse noise signals to said first video line, and
second shift register means for producing second clock pulse noise signals, said second clock pulse noise signals being coupled to said second plurality of switching elements for periodically applying said second clock pulse noise signals to said second video line in a known time relationship with respect to the application of said first pulse noise signals to said first video line,
whereby said video signals are produced at the output of said summing device and said clock pulse noise signals are suppressed within said summing device.

4,145,722

IMAGE PICKUP TUBE DEVICES

Fumihide Takeuti; Toru Takigawa, both of Mobara, and Kenichi Takada, Sendai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,608
Claims priority, application Japan, Jun. 28, 1976, 51-75548
Int. Cl.[2] H04N *5/21*
U.S. Cl. 358—223 **5 Claims**



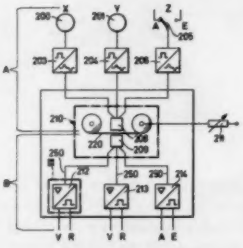
1. In an image pickup tube device of the type comprising an image pickup tube having a face plate at one end and a coil assembly surrounding said tube concentrically therewith with a small clearance therebetween, and a bias light source device including a plurality of luminous elements mounted in a hollow circular disc shaped frame for irradiating said face plate with bias light, the improvement wherein said frame has a first circular recess on one side thereof facing the face plate for snugly receiving said face plate such that said frame may be mounted directly to said face plate in coaxial relationship with respect to said image pickup tube.

4,145,723

CONTROLLER FOR A NUMERICALLY-CONTROLLED FORM-CUTTING MACHINE

Horst Mucha; Wilhelm Arnoldi; Kurt Fattler, all of Aachen; Albrecht Overath, D Wurselen; Friedrich Halberschmidt, Herzogenrath; Heinz-Josef Reinmold, and Josef Audi, both of Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, France

Filed Oct. 12, 1977, Ser. No. 841,471
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646053
Int. Cl.[2] G11B *31/00*; B26D *5/30*
U.S. Cl. 360—79 **5 Claims**



1. An electric control system for a numerically controlled form-cutting machine having two drive motors, an X-direction drive motor for moving a cutting tool in an X direction and a Y-direction drive motor for moving the cutting tool in a Y direction, the control system comprising:
(a) X-channel program-encoding means having a forward-increment input terminal, a reverse-increment input terminal, and an encoded-signal output terminal for receiving first pulsed signals at its forward-increment input terminal and second pulsed signals at its reverse-increment input terminal, converting the first and second pulsed signals into first and second encoded pulsed signals respectively, the wave form of the first encoded pulsed signal differing from the wave form of the second encoded pulsed signal, and transmitting the encoded pulsed signals from the encoded-signal output terminal;
(b) Y-channel program-encoding means having a forward-increment input terminal, a reverse-increment input terminal, and an encoded-signal output terminal for receiving first pulsed signals at its forward-increment input terminal and second pulsed signals at its reverse-increment input terminal, converting the first and second pulsed signals into first and second encoded pulsed signals respectively, the wave form of the first encoded pulsed signal differing from the wave form of the second encoded pulsed signal, and transmitting the encoded pulsed signals from the encoded-signal output terminal;
(c) a magnetic tape unit having a magnetic tape transport, a first recording/playback channel, and a second recording/playback channel, each recording/playback channel including a recording input terminal and a playback output terminal and being adapted to record a signal applied to the recording input terminal on a single track of magnetic tape and to transmit a signal from the playback output terminal corresponding to the signal recorded on the track of magnetic tape;
(d) conductive means connecting the encoded-signal output terminal of the X-channel program-encoding means to the recording input terminal of the first recording/playback channel of the magnetic tape unit;

(e) conductive means connecting the encoded-signal output terminal of the Y-channel program-encoding means to the recording input terminal of the second recording/playback channel of the magnetic tape unit;

(f) X-channel program-decoding means having a program-playback-signal input terminal, a forward-increment output terminal, and a reverse-increment output terminal for receiving an encoded pulsed playback signal at its program-playback-signal input terminal, processing the encoded pulsed playback signal to discriminate between playback wave forms derived from the first and the second encoded pulsed signal of section (a), and transmitting a drive-motor-control pulsed signal from the forward-increment output terminal or the reverse-increment output terminal in accordance with the outcome of the discrimination processing;

(g) conductive means connecting the playback output terminal of the first recording/playback channel of the magnetic tape unit to the program-playback-signal input terminal of the X-channel program-decoding means;

(h) Y-channel program-decoding means having a program-playback-signal input terminal, a forward-increment output terminal, and a reverse-increment output terminal for receiving an encoded pulsed playback signal at its program-playback-signal input terminal, processing the encoded pulsed playback signal to discriminate between playback wave forms derived from the first and the second encoded pulsed signal of section (b) and transmitting a drive-motor-control pulsed signal from the forward-increment output terminal or the reverse-increment output terminal in accordance with the outcome of the discrimination processing; and

(i) conductive means connecting the playback output terminal of the second recording/playback channel of the magnetic tape unit to the program-playback signal input terminal of the Y-channel program-decoding means.

4,145,724

AUTOMATED MAGNETIC TAPE CARTRIDGE RETRIEVAL HANDLING AND REPLAY MACHINE

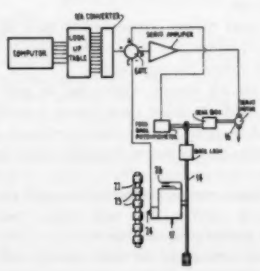
Reuben Medding, North Caulfield, and Peter D. Kaye, Glen Waverley, both of Australia, assignors to Consolidated Electronic Industries Pty., Ltd., Australia

Filed Jul. 18, 1977, Ser. No. 816,911

Claims priority, application Australia, Jul. 16, 1976, PC6658; Dec. 20, 1976, PC8551

Int. Cl.[2] G11B *15/68, 23/04*

U.S. Cl. 360—92 **6 Claims**



1. Apparatus for storing, retrieving and replacing information contained within discrete magnetic tape information bearing cartridges comprising a storage area for storing a plurality of said cartridges each having a predetermined and designated location in the storage area; at least one processing station for extracting information from individual cartridges; computer memory means for storing a play schedule for sequential movement of said cartridges through said processing station and having a computer output, said computer output including a look up table allowing access to the computer output to enable adjustment of the computer output; mechanical selection means operatively connected to said computer memory means operable in response to signals received therefrom to retrieve an individual cartridge and transfer it to the processing station and to return same to its designated location in the storage area; motor means driving said mechanical selection means, said motor means being driven by power transmitted to it as a result of said computer signals; voltage feed back loop interconnecting the motor output and said computer output whereby the positioning of the selection mechanism at a designated location of a said cartridge is self correcting.

4,145,725

ELECTROMAGNETIC ACTUATOR

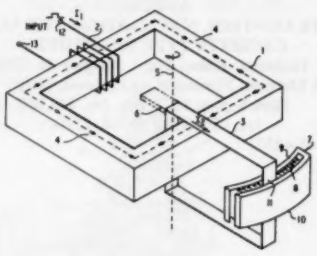
Christopher N. Wallis, Hampshire, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,095

Claims priority, application United Kingdom, Dec. 20, 1976, 53033/76

Int. Cl.[2] G11B *17/00*

U.S. Cl. 360—106 **13 Claims**



1. An electromagnetic actuator comprising:

a transformer having a fixed primary winding magnetically coupled by a magnetic core to a secondary coil,

means for pivotally mounting said coil,

means to generate a static magnetic field coupled to said coil, said last mentioned means including a pole gap within which said coil may move, and

an actuator arm fixedly attached to said coil and capable of pivotal movement whereby, when a current pulse is applied to said primary winding, a current is induced in said coil which reacts with the static magnetic field causing pivotal movement of said coil and attached arm.

4,145,726

VIDEO RECORD PACKAGE

Francis X. Conaty, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 821,201, Aug. 2, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 928,419

Int. Cl.[2] G11B *5/82, 17/00, 25/04;* **B65D** *85/02*

U.S. Cl. 360—133 **9 Claims**

1. A record and package combination comprising:

(A) a disc record having a first set of information recorded on a first side thereof;

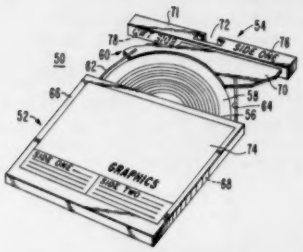
(B) a jacket having a record enclosing cavity and an end access opening in communication therewith;

(C) a record retaining spine reciprocably mounted within said cavity; said spine substantially extending into said end access opening when it is fully inserted into said jacket;

(D) means secured to said spine for limiting relative motion between said spine and an enclosed record; and

(E) indicia secured to said spine for associating said first side

of said record with a given side of said spine; said record being enclosed within said cavity such that said first side



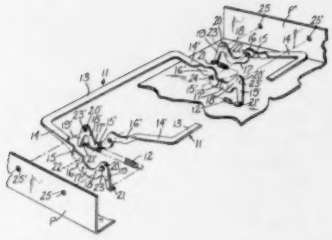
of said record is on the same side of said jacket as said given side of said spine.

4,145,727

CASSETTE CONTROL MECHANISMS FOR MAGNETIC CASSETTE TYPE RECORDERS

Domenico Tuninetti, Rome, Italy, assignor to SPEM-Societa Prodotti Elettroni Meccanici a.r.l., Rome, Italy

Filed Sep. 6, 1977, Ser. No. 830,680
Int. Cl.[2] G11B *15/68, 25/00*
U.S. Cl. 360—137 **3 Claims**



1. In combination with a tape recorder of the cassette type defining a chamber adapted to house a cassette, wherein the cassette can move between an introduction and ejection position and an operating position, control means for moving said cassette comprising the combination of:

(i) a movable support element adapted to support said cassette in constant orientation, said movable support element comprising a resilient frame having two substantially identical U-shaped elements pivotable relative to each other and relative to said chamber, said U-shaped elements each comprising a straight portion and parallel first and second arms orthogonal thereto, said arms of one U-shaped element being each first pivotally mounted to one of the arms of the other U-shaped element intermediate the ends of each of the arms, each of said arms being secondly pivotally mounted to said housing intermediate the first pivotal mount and the end of said arms;

(ii) resilient means between the ends of the respective pairs of pivotally mounted arms biasing said ends together; and

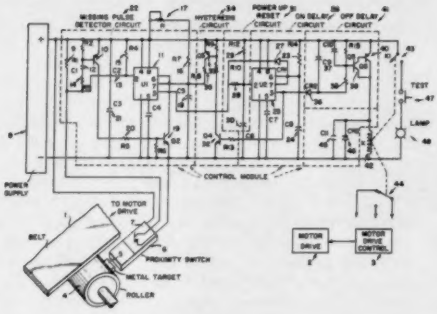
(iii) a push element adapted to exert a force on one point of the face of the cassette opposite the face engaging the support element to force the cassette to move between the introduction and ejection position and the operating position.

4,145,728

ROLLER BELT CONTROLS

Joel H. Royer, Indiana, Pa., assignor to B&B Electrical Manufacturing Co. Inc., Seward, Pa.

Filed Mar. 9, 1978, Ser. No. 884,562
Int. Cl.[2] H02H *7/08*
U.S. Cl. 361—23 **4 Claims**



1. In a rotational material handling assembly, a digital RPM sensor and motor disconnecting system comprising:

a. a means for detecting the RPM speed of a rotational material handling assembly and providing a digital pulse signal;

b. means for amplifying and switching said pulse signal connected to said detector means and for providing said pulse amplified signal;

c. means for detecting missing pulse signals receiving said amplified pulse signal to check the timing of said amplified pulse signal;

d. time setting means connected to said missing pulse detector means providing the proper time setting corresponding to the allowable speed of said rotational material handling assembly;

e. an on delay timer means connected to said missing pulse detector means to act as an overspeed verification so that the output from said missing pulse detector means, representing an overspeed condition, must exist for a preset period of time before an output from said on delay timer means is given;

f. power up reset means connected to said on delay timer means which eliminates false output signals from said on delay timer means during startup;

g. hysteresis circuit means connected to said time setting means and said on delay time means providing a lower said allowable speed setting during normal operations to prevent nuisance shutdown at speeds near the said allowable speed;

h. off delay timer means connected to said on delay timer means which verifies that said lower speed condition exists for a preset period of time;

i. relay means connected to said on and off delay timer means which activate when said proper speed setting is detected by said missing pulse detector means;

j. relay protection means connected to said relay means to protect said off delay timer means from high voltage during rapid activation of said relay means;

k. relay test and visual indication means connected to said relay means;

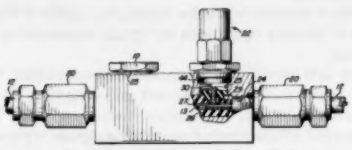
l. switching means connected to said relay means to provide motor drive control to motor of said rotational material handling assembly.

4,145,729

SURGE PROTECTOR ASSEMBLY

Robert D. Hayward, Phoenix, Ariz., assignor to Gilbert Engineering Company, Inc., Phoenix, Ariz.

Filed Feb. 27, 1978, Ser. No. 881,752
Int. Cl.[2] H02H *1/04*
U.S. Cl. 361—119 8 Claims



1. A surge protector assembly for holding a surge protector device, which device includes:

a body having first and second electrically conductive ends, and for detachably installing said device into a cable transmission system, which system includes

a fixed device having electrical contact means therein and having an access port with engagement means communicating with said contact means,

said surge protector assembly comprising:

(a) an electrically conductive outer body having first and second ends and an axial bore extending between said ends;

(b) complementary engagement means proximate the first end of said body for detachable connection with the engagement means of said fixed device;

(c) an electrically conductive inner body having first and second ends and moveably disposed within the bore of said outer body;

(d) retention means proximate the first end of said inner body for holding said surge protector device and electrically contacting the first end thereof; and

(e) advancement means for effecting relative axial movement between said inner body and said outer body

whereby the second end of said surge protector is urged into electrical contact with said contact means.

4,145,730

FLASH LAMP ARRAY HAVING A POSITIVELY ACTING FLASH SENSING INDICATOR

Nicholas J. Rainone, Clifton, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 27, 1977, Ser. No. 864,309
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—10 8 Claims

1. In combination with a flash lamp array including a plurality of flash lamps and sequencing electrical circuitry for sequentially flashing lamps, said array further including a two-sided circuit board having said sequencing circuitry affixed to one side thereof, said lamps positioned in close proximity to said one side of said circuit board, said circuit board provided with windows therethrough each in alignment with one of said lamps to permit the passage of radiant energy upon the flashing of each of said aligned lamps, the improvement which comprises:

a flash sensing indicator in close proximity to said other side of said circuit board and readily observable by an operator of said flash lamp array, said flash sensing indicator comprising an opaque nonreactive member having apertures provided therein each in alignment with one of said windows provided in said circuit board, said flash sensing indicator further including a generally flat radiation sensitive means affixed to one side of said opaque nonreactive member nearest said circuit board and having sections thereof overlaying said apertures provided in said nonreactive member, each of said overlaying radiation-sensitive sections operable to receive some of the radiant energy emitted by the flashing of one of said aligned lamps and operable to constrict and change appearance upon being irradiated to provide an indicia of such flashing, and said overlaying radiation-sensitive sections each provided with a structurally-weakened portion substantially traversing a lateral dimension of said overlaying radiation-sensitive sections so that upon irradiation by the flashing of one of said aligned lamps, the irradiated one of said overlaying radiation-sensitive sections will readily separate at said structurally-weakened portion to readily constrict upon itself to positively provide the desired change in appearance of said irradiated overlaying section.

4,145,731

SIMULATED EXTENDABLE AND COLLAPSIBLE EVERGREEN TREE

Anthony A. Adamich, 3618 E. 4th St., Duluth, Minn. 55804

Filed Jul. 29, 1977, Ser. No. 820,305
Int. Cl.[2] B65D *65/28;* G09F *1/08*
U.S. Cl. 362—123 2 Claims

1. A display card having a simulated extendable and collapsible evergreen tree formation contained within the same comprising:

(a) a fold sheet divided by a fold line into a first page and

(b) a second page,

(c) a support sheet mounted on said second page which together with said second page forms a base,

(d) said support sheet having a continuous cut formed therethrough starting at a point removed from the center of the support sheet and proceeding inwardly of the sheet in a circular formation in an ever decreasing diameter to form a spiral having flat upper and lower opposed surfaces and connected to the support sheet at one end with the other end free and having

(e) a central formation on the free end,

(f) a support rod,

(g) said central formation having means for engagement of a first end of said rod,

(h) said support sheet having means carried thereby for engagement with the second end of said support rod,

(i) said first end of said support rod engaged in said engagement means of said central formation and said second end of said support engaged in said engagement means carried by said support sheet supporting said spiral in extended fixed condition with said flat surfaces of said spiral being substantially normal to the axis of the support rod and substantially parallel to the flat support sheet, the removal of said support rod causing said spiral to assume a flattened collapsed condition upon said second page and upon which said first page is positioned for protection and concealment of the spiral.

4,145,732

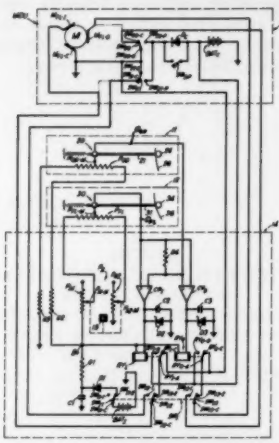
RATIO PRESERVING CONTROL SYSTEM FOR A LENS

Dave Pandres, Jr., 111 Walker Dr., Dahlonega, Ga. 30533

Continuation-in-part of Ser. No. 820,005, Jul. 28, 1977. This application Apr. 10, 1978, Ser. No. 895,139

Int. Cl.[2] G06G 7/66; G02B 7/10

U.S. Cl. 364—109 **7 Claims**



1. An interlock mechanism for an operating system including first and second independently controllable operational control parameters comprising:

first means for generating a first output which is the logarithmic value to a common base of the actual value of the first operational control parameter;

second means for generating a second output which is the logarithmic value to the common base of the actual value of the second operational control parameter;

control means operatively connected to said first means and said second means, said control means selectively and operatively connected to said second operational control parameter to selectively change the actual value of said second operational control parameter, said control means responsive to said first and second outputs to change the actual value of the second operational control parameter in response to change of the actual value of the first operational control parameter so that a prescribed ratio is maintained between the actual value of the first operational control parameter and the actual value of the second operational control parameter, and said control means including adjustment means for selectively changing the prescribed ratio maintained between the actual values of said first and second operational control parameters by said control means independently of the setting of said first and second control parameters.

4,145,733

DATA PROCESSING APPARATUS FOR HIGHLY PARALLEL EXECUTION OF STORED PROGRAMS

David P. Misunas, Brighton, and Jack B. Dennis, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 605,932, Aug. 19, 1975, which is a continuation-in-part of Ser. No. 456,488, Mar. 29, 1974, Pat. No. 3,962,706. This application Sep. 7, 1976, Ser. No. 721,083

Int. Cl.[2] G06F 3/00, 13/00; G06K 17/00

U.S. Cl. 364—200 **23 Claims**

1. A digital data processor comprising:

(a) active memory means for holding at least a record of active instructions, said active memory means containing a plurality of cells, each cell holding one instruction of said record of active instructions and each cell having a unique index;

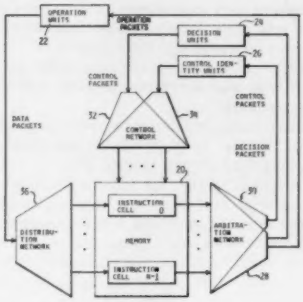
(b) operation means for managing signals in the execution of arithmetic and logical operations on signals representing data values;

(c) decision means for managing signals in the execution of comparison and testing operations on signals representing data values;

(d) control identity means for managing signals in the execution of identity operations on signals representing control values;

(e) first arbitration means operatively connected between said active memory means and said operation means and between said active memory means and said decision means for concurrently transmitting signals representing a plurality of first information packets from said active memory means to said operation means and said decision means, each of said signals representing first information packets consisting of signals representing an instruction of said record of active instructions together with data values required for its execution;

(f) second arbitration means operatively connected between said active memory means and said control identity means for concurrently transmitting signals representing a plurality of second information packets from said active memory means to said control identity means, each of said signals representing second information packets consisting



of signals representing control values necessary to insure correct operation of said digital data processor;

(g) first control means operatively connected between said decision means and said active memory means for concurrently transmitting signals representing a plurality of third information packets from said decision means to said active memory means, each of said signals representing third information packets consisting of signals representing Boolean values computed by said decision means and required for the execution of said record of active instructions contained in said cells of said active memory means;

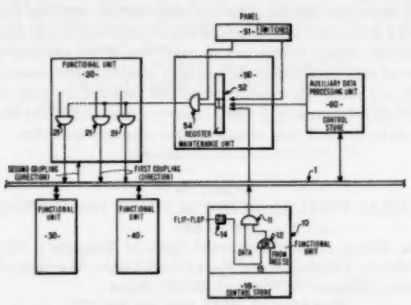
(h) second control means operatively connected between said control identity means and said active memory means for concurrently transmitting signals representing a plurality of fourth information packets from said control identity means to said active memory means, said signals representing fourth information packets consisting of signals representing control values necessary to insure correct operation of said digital data processor; and

(i) distribution means operatively connected between said operation means and said active memory means for concurrently transmitting signals representing a plurality of fifth information packets from said operation means to said active memory means, said signals representing fifth information packets consisting of signals representing data values computed by said operation means and required for execution of said record of active instructions contained in said active memory means.

4,145,734
METHOD AND APPARATUS FOR IMPLEMENTING THE TEST OF COMPUTER FUNCTIONAL UNITS

Jacques M. J. Bienvenu, Paris, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 570,404, Apr. 22, 1975, abandoned.
This application Jan. 18, 1977, Ser. No. 760,326
Int. Cl.[2] G06F 11/00
U.S. Cl. 364—200 11 Claims



1. A method for implementing the test of a plurality of functional units of a data processing system in the course of its normal operation, the functional units being normally interconnected by a bidirectional bus, the data processing system including means for applying imposed test conditions to each of the functional units, whereby each functional unit responds to the imposed test conditions to provide test results, and means for comparing the test results with a series of reference values which correspond respectively within the normal operation of the functional unit to determine when a functional unit is faulty, the bidirectional bus being connectable to establish a connection in a first direction from each of the functional units to the bidirectional bus and to establish a connection in a second direction from the bidirectional bus to each of the functional units, said method comprising the steps of:

(a) establishing and maintaining the connection of the bidirectional bus to each of said functional units and disconnecting the connection in the first direction of each of the functional units from the bidirectional bus;

(b) applying from the applying means at least one of the imposed test conditions to the bidirectional bus;

(c) reconnecting in the first direction a first functional unit whereby the test result developed by the first functional unit is applied via the bidirectional bus to the means for comparing to determine if the first functional unit is faulty; and

(d) reconnecting each of the other functional units in a predetermined order in the first direction so that the test results are applied one by one via the bidirectional bus to the means for comparing, whereby each of the functional units is tested in the predetermined order to determine whether it is faulty.

4,145,735
MONITOR FOR PRIORITY LEVEL OF TASK IN INFORMATION PROCESSING SYSTEM

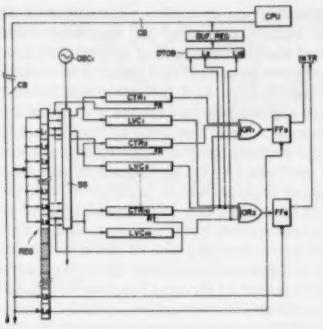
Hiromu Soga, Kitakyushu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 2, 1977, Ser. No. 765,002
Int. Cl.[2] H04J 3/08; G06F 9/18; G05B 11/36
U.S. Cl. 364—200 5 Claims

1. In a data processing where a number of tasks share a central processing unit according to a plurality of priority levels, a priority level monitor comprising:

a control register coupled to said central processing unit for receiving from said central processing unit signals indicating the beginning of the execution of a task, the completion of the execution of that task and the priority level associated with that task and for storing said signals;

a priority level timer connected to said control register for measuring the execution time of each task processed by said central processing unit and for generating an overflow signal when the execution time of a task exceeds a predetermined permissible execution time allowed to tasks having the priority level of said task; and

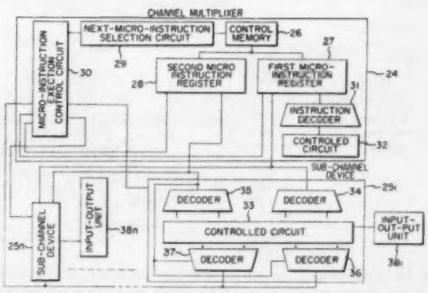


an interrupt signal generator connected to said priority level timer and said central processing unit for generating an interrupt signal and transmitting said interrupt signal to said central processing unit when said priority level timer generates said overflow signal, whereby said apparatus monitors the execution time of tasks assigned to each priority level and causes a task to be aborted when the execution time of the task exceeds a predetermined permissible execution time allowed to tasks of that priority level.

4,145,736
MICROPROGRAM CONTROL DEVICE

Takahiko Yamada, Tokyo; Shigeki Yamada, Tokorozawa; Yoshio Sakurai, Tokyo; Kazuo Furukawa, Yokohama; Syoji Kajitsuka, Tokyo, and Toshio Awaji, Sagamihara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation; Nippon Electric Co., Ltd.; Hitachi, Ltd.; Oki Electric Industry Co., Ltd. and Fujitsu Limited, all of, Japan

Filed Feb. 14, 1977, Ser. No. 768,089
Claims priority, application Japan, Feb. 17, 1976, 51-15414
Int. Cl.[2] G06F 9/16, 9/18
U.S. Cl. 364—200 4 Claims



1. A microprogram control device for time-shared control of a plurality of controlled devices each comprising a microinstruction decoder, a microinstruction test circuit, and a microinstruction execution request circuit, said device comprising:

a control memory for storing microinstructions for control-

ling said plurality of controlled devices and for reading out said microinstructions in one machine cycle,

a first microinstruction register for storing first type microinstructions read out of said control memory and controlling one controlled device over a plurality of machine cycles,

a second microinstruction register for storing second type microinstructions read out of said control memory and controlling one controlled device in one machine cycle, and

a microinstruction execution control circuit for receiving input signals consisting of microinstruction-execution-request signals from each of said microinstruction-execution-request circuits of said plurality of controlled devices, first signals from said first microinstructon register and second signals from said second microinstruction register,

said microinstruction execution control circuit selecting said second microinstruction register and one controlled device controlled by control signals of said second microinstruction register, which is different from the controlled device then being controlled by said one of said first type microinstructions, when said input signals correspond to a given instruction that one of the first type microinstructions controls one controlled device in a certain machine cycle and then in the next machine cycle, and

said microinstruction execution control circuit selecting one of said first and second microinstruction registers and one controlled device controlled by control signals of said selected register of the first and second microinstruction registers, when said input signals correspond to any instruction other than said given instruction,

whereby one controlled device controlled by the control signals of said first microinstruction register and the other controlled device controlled by the control signals of said second microinstruction register are effectively controlled in parallel.

4,145,737
ASSOCIATIVE MEMORY DEVICE WITH TIME SHARED COMPARATORS

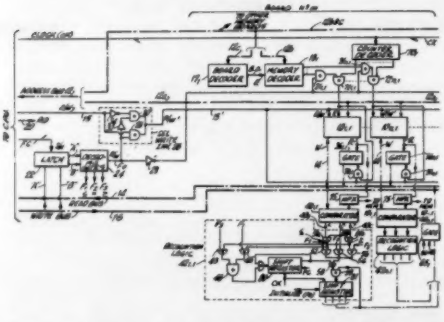
Sydney M. Lamb, North Haven, Conn., and David B. Hurt, Mountain View, Calif., assignors to Semionics Associates, Berkeley, Calif.

Filed Apr. 19, 1977, Ser. No. 788,794

The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.

Int. Cl.[2] G06F 7/34

U.S. Cl. 364—200 **13 Claims**



1. In combination in an associative memory, a plurality of random access memory modules each including plural information storage addresses, plural comparator means, means connecting each of said comparator means to a different set of said random access memory modules for receiving information read out therefrom, data bus means connected to each of said memory modules and each of said comparator means for supplying information to and receiving information from said random access memory modules during memory write and read operations respectively, and supplying match information to said plural comparator means during associative memory operation, memory accessing means including common address bus means connected to said memory modules, each of said comparator means including means for comparing the information supplied thereto by said associated set of memory modules with information present on said data bus means and for developing an output signal representing the results of said comparison, and means for storing said output result signals of said comparator means, wherein each of said random access memory modules comprises read and write control port means, read-write means connected to said read-write control port means of said random access memory modules, and means for selectively inverting a write command supplied by said read-write control means to thereby impress a read command at said read-write control port means of said memory modules.

4,145,738
PLURAL VIRTUAL ADDRESS SPACE PROCESSING SYSTEM

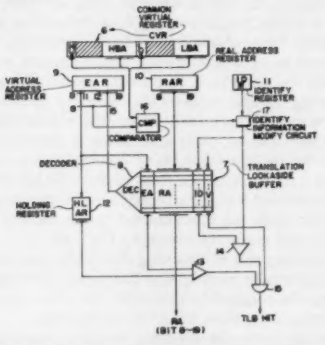
Koichi Inoue; Hajime Nonogaki, both of Kamakura; Tatsuo Urakawa, Yokohama, and Kazuyuki Shimizu, Machida, all of Japan, assignors to Fujitsu Limited, Japan

Filed May 31, 1977, Ser. No. 801,571

Claims priority, application Japan, Jun. 8, 1976, 51-66807

Int. Cl.[2] G06F 9/20

U.S. Cl. 364—200 **8 Claims**



1. A plural virtual address space for processing system for a data processing system for performing data processing and which comprises a translation mechanism means for translating a virtual address into a real address and a memory means, operatively connected to said translation mechanism means, for storing the real address translated by the translation mechanism means and in which when data processing is performed, if a desired real address is stored in the memory means, the real address is used for data processing and if not stored in the memory means, the desired real address is obtained with the translation mechanism means, said plural virtual address space processing system comprising:

common area indicating means, operatively connected to said translation mechanism means, for indicating the range of a common area in which the same virtual address is translated into the same real address in each virtual address space; and

a comparator circuit, operatively connected to said translation mechanism means and said common area indicating means, for detecting whether or not the virtual address to be translated into the real address lies in the range indicated by the common area indicating means;

wherein when the real address is stored in the memory means, if the virtual address corresponding to the real address is indicated by said common area indicating means as an address of the common area, then common area identify information is stored together with the real ad-

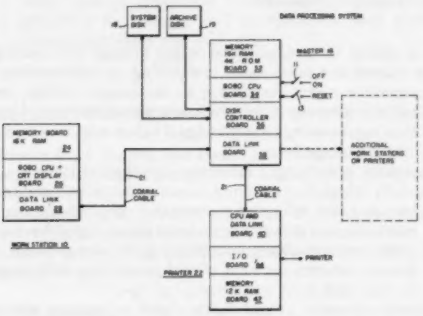
dress, and wherein if the virtual address corresponding to the real address is indicated by said common area indicating means as an address of another area than the common area, then virtual address space identify information is stored together with the real address.

4,145,739

DISTRIBUTED DATA PROCESSING SYSTEM

Donald R. Dunning, Tewksbury; Harold S. Koplow, Lynnfield; David Moros, Winchester; An Wang, Lincoln, and A. Edward Wild, Jr., Merrimac, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jun. 20, 1977, Ser. No. 808,112
Int. Cl.[2] G06F *3/00, 9/00, 15/16*
U.S. Cl. 364—200 10 Claims



1. A distributed data-processing system for processing informational data, comprising

a resource memory having

read-only memory for storing operational instruction data for said system, and

on-line storage for storing said informational data,

a master device having a master central processor, a master memory, a master data link, and a resource control unit, and master internal buses interconnecting said master central processor, master memory, master data link and resource control unit, and initiating means,

at least one slave device having

elements including a slave central processor, a slave memory, a slave data link,

slave internal buses interconnecting said slave central processor, slave memory and slave data link,

input and output means for inputting and outputting said informational data,

said slave memory including a dedicated semaphore area, said slave central processor having means to set said semaphore area content to a particular value indicating a request for access to said resource memory,

a data link data-carrying line connecting each said slave data link to said master data link,

a resource memory data-carrying line connecting said master resource control unit to said resource memory,

said master central processor having access means directly to read or write each said slave memory via said external data-carrying line and said slave internal buses independent of said slave central processor,

said master central processor being responsive to said initiating means periodically directly to read said semaphore area,

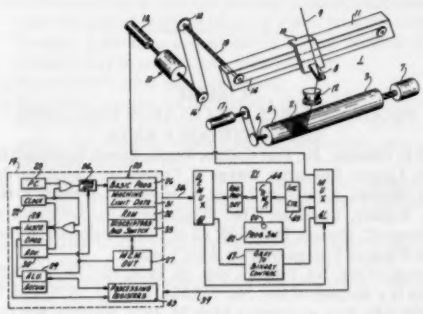
said master device being responsive to said particular value of said semaphore area content directly to transfer data between said resource memory and said slave memory via said resource memory date-carrying line, said data link data-carrying line and said slave internal buses independent of said slave central processor.

4,145,740

FILAMENT WINDING APPARATUS

William G. McClean, Milwaukee, and Daniel C. Budge, Menomonee Falls, both of Wis., assignors to Tri-N Associates, Inc., Milwaukee, Wis.

Filed Jan. 21, 1977, Ser. No. 760,937
Int. Cl.[2] G06F *15/46;* B65H *81/00*
U.S. Cl. 364—469 16 Claims



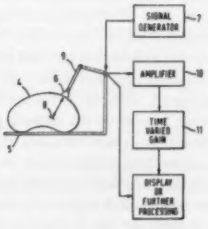
1. A filament winding apparatus having a rotating support mandrel and a filament positioning means movable relative to the mandrel from a reference position for controlling the positioning of a filament on the mandrel, comprising first encoder means for producing an output signal corresponding to the rotation of the mandrel, a second encoder means coupled to the filament positioning means for producing an output signal corresponding to the absolute positioning of the positioning means, a drive means for positioning the filament positioning means and including an input, and a microprocessor means including a programmable memory for storing at least one program describing the motion of the filament positioning means in terms of the rotation of the mandrel and utilizing the input data from the first and second encoder means to calculate the proper motion of the filament positioning means, and means to generate a signal to the drive means in accordance with the calculated position and the output of the absolute encoder.

4,145,741

SIGNAL PROCESSING ARRANGEMENTS

Donald Nappin, South Harrow, England

Filed Jul. 19, 1977, Ser. No. 816,946
Claims priority, application United Kingdom, Jul. 23, 1976, 30764/76
Int. Cl.[2] G06G *7/12*
U.S. Cl. 364—571 6 Claims



6. A system for investigating a region of interest by means of ultrasonic energy including means for transmitting pulses of ultrasonic energy into a medium in which the region of interest is located, means for receiving the pulses after reflection at a reflective feature in the region of interest and after suffering attenuation in the medium according to an attenuation func-

tion, which is an exponential function of their propagation time, and for providing signals representative of said received pulses and processing means including means for converting the signals to logarithmic form, means for generating a linear ramp signal, representing the logarithm of the attenuation function, and means for effectively subtracting the ramp signal from the logarithmically converted first mentioned signals to counter the effects of attenuation in said medium.

4,145,742

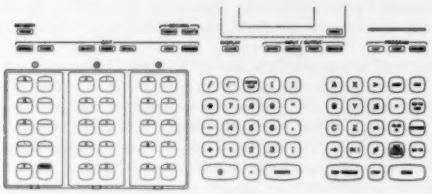
PROGRAMMABLE CALCULATOR INCLUDING USER-DEFINABLE KEYS

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application May 24, 1977, Ser. No. 800,131

Int. Cl.[2] G06F *3/02*

U.S. Cl. 364—709 **27 Claims**



1. An electronic calculator comprising:

keyboard input means having a plurality of alphabetic and numeric keys for entering alphameric information, including arithmetic expressions, into the calculator;

memory means, coupled to said keyboard input means, for storing alphameric information entered into the calculator;

processing means, coupled to said keyboard input means and memory means, for processing alphameric information entered into the calculator to perform selected functions; and

output means, coupled to said processing means, for providing a visual indication of the results of selected functions performed by said processing means;

said keyboard input means including an execute control key for initiating execution of an arithmetic expression entered into the calculator, a store control key for initiating storage of an arithmetic expression entered into the calculator, at least one definable key, and means for defining a function to be associated with each definable key, said store control key being operative for initiating storage of each such defined function in said memory means;

said processing means being responsive to actuation of said execute control key, following actuation of a definable key and one or more other keys collectively representing an arithmetic expression for executing the defined function for that definable key as a part of that arithmetic expression, said processing means being further responsive to actuation of said store control key, following actuation of a definable key and one or more other keys collectively representing an arithmetic expression, for storing the defined function for that definable key as a part of that arithmetic expression in said memory means.

4,145,743

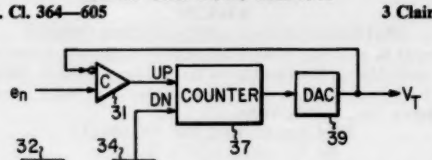
VOLTAGE LEVEL GENERATOR USING DIGITAL INTEGRATION

John A. DiCiurcio, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,687

Int. Cl.[2] G06F *15/32*; G06J *1/00*

U.S. Cl. 364—605 **3 Claims**



1. A circuit for producing an output voltage level having a value related to a noise signal comprising, in combination:

comparator means responsive to the output voltage level and the noise signal for producing a resultant digital pulse train representing the noise signal values which exceed the output voltage level;

means for generating a reference digital pulse train;

digitally integrating counting means responsive to said resultant and said reference pulse trains supplied thereto for producing a continuously updated digital signal having an instantaneous value proportional to the accumulated difference between the rates of said pulse trains with respect to time; and

means responsive to said digital signal to produce said output voltage level with a magnitude proportional to the digital signal.

4,145,744

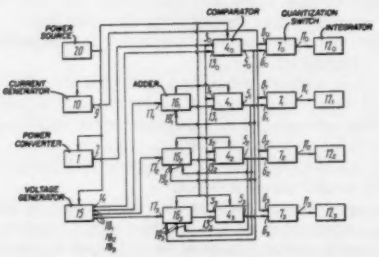
STATISTICAL ANALYZER OF WORKING PROCESS PARAMETERS OF MACHINERY

Vladimir G. Sidorovich; Alexandr V. Dokukin; Evgeny M. Shmarian; Vladimir V. Kazakov, all of Moscow, and Alexandr I. Lepikhov, Konotop Sumskoi oblasti, all of U.S.S.R., assignors to Institut Gornogo Dela Imeni A.A. Skochinskogo, Moscow, U.S.S.R.

Filed Jul. 19, 1977, Ser. No. 817,530

Int. Cl.[2] G01D *1/14*; H03K *13/175*

U.S. Cl. 364—554 **1 Claim**



1. A statistical analyzer of working process parameters of machinery, comprising:

a converter of physical quantities, which characterize operating conditions of machinery, to voltage;

a plurality of comparators, whose number is equal to that of voltage quantization levels, each having a direct input connected to the output of said converter of physical quantities to voltage, and an output;

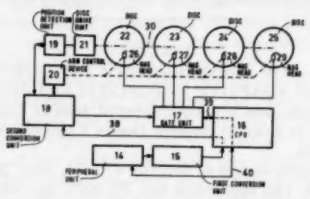
a plurality of switches, each having a control input connected to the output of a respective comparator, and an output;

a stabilized pulse current generator having an output connected to a second input of a respective switch;
a plurality of recorders connected to said outputs of said respective switches;
a plurality of adders corresponding to the voltage quantization levels from the lowest to the highest but one, each having an output connected to a respective comparator, and a group of inputs;
a standard voltage generator having a group of outputs connected to a respective adder, and an output connected to that of said comparators which corresponds to the highest quantization level, and an input;
the output of each of said comparators being connected to said input of said group of inputs of a respective adder correspondong to a quantization level which is one level below the quantization level corresponding to this comparator;
a power source connected to said converter of physical quantities to voltage, said comparators, said standard voltage generator and said adders.

4,145,745
ADDRESS CONVERSION DEVICE FOR SECONDARY MEMORIES

Adrianus M. J. De Bijl, and Hans Cramwinckel, both of Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 640,703, Dec. 15, 1975, abandoned. This application Jun. 22, 1977, Ser. No. 809,114
Claims priority, application Netherlands, Dec. 20, 1974, 7416631
Int. Cl.[2] G06F *5/00, 13/00*
U.S. Cl. 364—200 **31 Claims**



1. A programmable address conversion device for use with computer systems having input means, a central procesor, a central memory, and auxiliary memory units such as disc units, tape units, magnetic bubble units and the like, which receives as input a binary logical representation of a user program address, decodes and demultiplexes the logical address and converts it to a physical address on a specific auxiliary memory unit, comprising:
a first conversion unit which receives as its input a binary word representation of a user program address in terms of a file and an object addressed from an input means;
said first conversion unit comprising:
an input address register which receives said user input address word as a binary logical address;
a first storage unit which receives the first two most significant bits of said logical address from said input address register;
a second storage unit which receives the full binary word of said logical address from said input address register;
said first storage unit containing the initial logical address of the file addressed and the logical length of said file in said auxiliary memory unit;
said secondary storage unit containing logical representations of the rank of the addressed object within said file and the physical length of said file;
a first output register which receives from said secondary storage unit the first basic logical address of an addressed file;
a second output register which receives from said storage unit the binary representations of rank of the object addressed within the file by the user program address;
a calculating member which receives the outputs of said output registers and adds the contents of said output registers to form a generalized logical address;
an accumulator register which receives the results of said programmed calculations;
a control unit to control the operation of said first conversion unit;
said first conversion unit thus serving to decode and demultiplex the logical representation of a user program address; thereby generating a generalized logical address of addressed data in an auxiliary memory unit;
a second conversion unit comprising:
a first input register to receive the generalized logical address output of said first conversion unit for use in calculating the physical address of said addressed data on an auxiliary memory unit;
a first static carry register serving as an input register and containing the number of storage sectors on a subdivision of the auxiliary memory unit;
a second static carry register serving as an input register and containing the number of auxiliary memory units;
a register for storing temporarily the contents of said static carry registers;
said static carry registers thus having as inputs the number of auxiliary memory units, the number of subdivisions thereof, and the number of storage sectors in each subdivision;
a calculating member which performs sequential programmed calculations on the logical address from the first input register and the inputs from the static carry registers, said programmed calculations being based on the generalized logical address from said first conversion unit and the physical parameters of the auxiliary memory unit as stored in said static carry registers;
an output register which receives the final results of the operations of said calculating member in the form of a physical address for the auxiliary memory unit, said physical address having three parts, the number of the auxiliary memory unit addressed, the number of the subdivision of the auxiliary memory unit addressed and the number of the storage sector addressed;
a counter which counts the physical movements of the auxiliary memory unit selected by said physical address;
a register to receive the subdivision portion of said physical address;
a comparator which compares the said portion of the physical address generated by said programmed calculation with the contents of said counter;
a decoder to decode the remainder of the physical address;
a gate unit having a plurality of gates, one of which will be opened by the output of said decoder to permit the addressing of said auxiliary memory unit in terms of a unit; a subdivision and a sector;
said second conversion unit serving to convert generalized logical addresses to physical addresses on said auxiliary memory unit in the form of electrical signals resulting in the operation of said auxiliary memory unit such that data may be read from and written onto a precise physical location.

4,145,746
ENGINE TESTER DISPLAY AND PRINTING TECHNIQUES

Gerald C. Trussell, Park Ridge; Robert W. Arnston, Schaumburg, and Daniel Elyashar, Chicago, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed Jan. 3, 1977, Ser. No. 756,532
Int. Cl.[2] G01L *25/00*; G06F *15/46*
U.S. Cl. 364—551 **16 Claims**

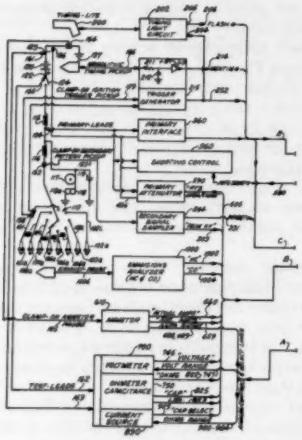
1. Apparatus for analyzing an internal combustion engine and for recording the results of the analysis comprising:

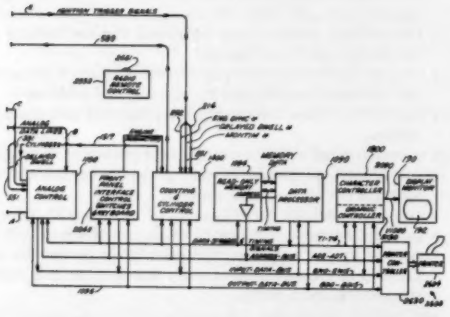
means connectable to the engine for generating when properly enabled first and second digital measurement signals corresponding to first and second engine conditions;

display means having a face for displaying at a first display location on the face a first number indicative of the first engine condition and for displaying at a second display location on the face a second number indicative of the second engine condition;

printer means for printing on a sheet at a first print location said first number and for printing on said sheet at a second print location said second number;

main memory means for storing a first display address signal corresponding to the first display location and first print location and for storing a second address signal corresponding to the second display location and second print location;





display controller means for enabling the display means to display the first number at the first display location in response to the first display address signal and a first digital display signal corresponding to the value of said first engine condition, and for enabling the display means to display the second number at the second display location in response to the second display address signal and a second digital display signal corresponding to the value of said second engine condition; printer controller means for enabliing the printer means to print the first number at the first print location in response to the first display address signal and said first display address signal and said first digital display signal, and for enabling the printer means to print the second number at the second print location in response to the second display addresss signal and the second digital display signal; and

processor means for enabling the means connectable to the engine to generate the first and second digital measurement signals for altering the value of the first and second digitial measurement signals to produce the first and second digital display signals, for transmitting the first digital display signal and first display address signal to the display controller means and printer controller means during a first time period, and for transmitting the second digital display signal and the second display address signal to the display controller means and printer controller means during a second time period, whereby the values of the first and second engine conditions are displayed in numerical form on the face of the display means and are printed on the sheet in order to create a permanent record.

12. A process automatically carried out by apparatus for analyzing an internal combustion engine and for creating a record of a portion of the analysis which indicates an engine problem comprising the steps of:

electronically generating first and second digital measurement signals corresponding to first and second engine conditions;

displaying a first number indicative of the first engine condition and a second number indicative of the second engine condition;

moving a cursor adjacent a selected one of the first or second numbers which appears to indicate an engine problem;

generating a flag control signal when the cursor is adjacent the selected one of the first or second numbers;

displaying a flag adjacent the selected one of the first or second numbers in response to the flag control signal;

storing a flag print signal identifying the selected one of the first or second numbers; and

printing the first and second numbers, the selected one of said numbers being distinctively identified by the printing.

4,145,747

METHOD FOR ESTABLISHING A TAP COEFFICIENT OF AN ADAPTIVE AUTOMATIC EQUALIZER

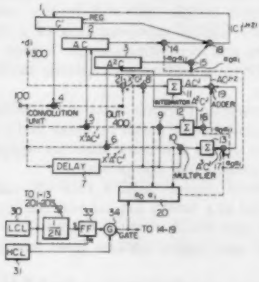
Hiroshi Sakaki, and Sotokichi Shintani, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 670,631, Mar. 25, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,700

Claims priority, application Japan, Mar. 25, 1976, 50-34906

Int. Cl.[2] **G06F** *15/34;* **H04B** *3/04*

U.S. Cl. 364—724 **4 Claims**



1. In a method for adjusting the tap coefficient of an adaptive automatic equalizer having a plurality of tapped registers comprising the steps of: applying an input signal repetitively to a train of tapped delay elements; obtaining a sum of the weighted output of each tap output; obtaining an error output by taking the difference between the sum of the weighted output of each tap output and a reference signal; and obtaining a correlation value between said error output and each tap output of said delay elements; the improvement comprising: storing the tap weights of each of said tapped registers; obtaining the total sum

of each tap weight of one of said tapped registers wherein the weight of a tap is said correlation value; repeating M times, where M is an integer, the obtaining the total sum of each tap weight in another of said tapped registers; adding said error output to said total sum; determining the value of a tap coefficient by the final total sum after M adjustments for the most rapid equalization; obtaining the optimum coefficient using said value of said top coefficient for the most rapid equalization of said tapped registers; and revising the weight of the taps of said delay elements by the optimum coefficient-weight-sum of the contents of said tapped register and said tapped delay elements, thereby adjusting the weight of each tap of said delay elements.

4. An adaptive automatic equalizer comprising:

(a) an input terminal, for receiving an input signal,

(b) a plurality of registers,

(c) a plurality of convolution units for calculating the convolution between the input signal and the content of one of said registers,

(d) a train of delay elements having a plurality of taps at each delay interval T, which is equal to the pulse interval of the input signal,

(e) an α computer means for computing the value (α) of the tap adjustment coefficient from the output of the convolution units,

(f) a plurality of multipliers for obtaining the product of the output of said delay elements and the output of said convolution units;

(g) a plurality of integrators having the inputs thereof connected to the output of the multipliers,

(h) changing means for changing the contents of each of said registers according to the output of said α computer means the outputs of said integrators and the precedent content of said registers,

(i) a low speed clock pulse generator, the frequency of which is the same as the sampling frequency on a transmission line, for operating said registers, convolution units, a train of delay elements and said integrators,

(j) a high speed clock pulse generator for operating said α computer means, said multipliers and changing means during a pair of low speed clock pulses in every MN low speed clock pulses, where M is an integer and N is a number of taps of said delay elements wherein said low speed clock pulse generator and said high speed clock pulse generator provide timing signals to said α computer means, and

(k) an output terminal connected to the output of one of said convolution units for providing the output of said equalizer.

4,145,748

SELF-OPTIMIZING TOUCH PAD SENSOR CIRCUIT

Charles W. Eichelberger, Schenectady, and Walter J. Butler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,875

Int. Cl.[2] G06G 7/12; G06F 7/02

U.S. Cl. 364—862 **9 Claims**

1. A touch pad sensor circuit comprising, in combination:

a plurality of drive lines;

a plurality of sense lines;

a plurality of capacitive touch pads, each having an input coupled to one of said drive lines and an output coupled to one of said sense lines, each touch pad being coupled between a different combination of drive and sense lines from any other touch pad;

driver circuit means for providing a drive signal to a selected one of said plurality of drive lines;

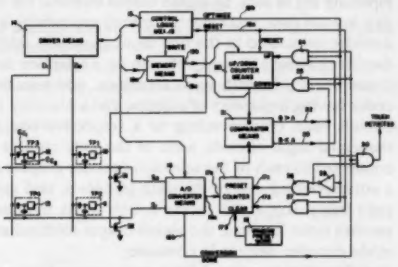
an A/D converter circuit;

means for selectively coupling each one of said plurality of sense lines to said A/D converter circuit;

control logic means coupled to said driver circuit means for determining the sequence in which each of said drive lines is selected to receive said drive signal in sequential manner; said control logic means also for causing said coupling means to couple sequential ones of said sense lines to said A/D converter circuit;

a counter connected to said A/D converter circuit for producing a count of the digital output thereof;

memory means coupled to said control logic means for storing a digital value representative of the magnitude of an output signal of each of said touch pads in a no-touch condition without contact thereof by an outside influence with said touch pad;



up/down counter means for receiving the no-touch digital value stored in said memory means for the one touch pad then coupled between a drive line having said driving signal thereon and said A/D converter circuit; and

comparator circuit means for comparing the digital output count of said counter and the no-touch digital value in said up/down counter means to produce an output signal when the count of the A/D converter circuit differs from the count in said up/down counter means by more than a preselected amount.

4,145,749

LOG IN-OUT SYSTEM FOR LOGIC APPARATUS

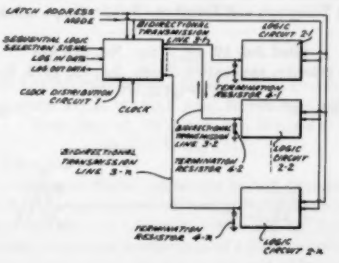
Tatsuro Yoshimura, Kawasaki; Takamitsu Tsuchimoto, Tokyo, and Katsuyuki Hamada, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 23, 1977, Ser. No. 836,077

Claims priority, application Japan, Sep. 29, 1976, 51-115994

Int. Cl.[2] G01R 15/00; G11C 7/00, 17/00

U.S. Cl. 364—900 **4 Claims**



1. A log in-out system for logic apparatus having a plurality of logic circuits, said logic circuits having a log in-out function, said log in-out system comprising

the plurality of sequential logic circuits each having first input terminals for inputting a mode signal which designates at least three modes including a clock mode, a log in mode and a log out mode, a second terminal for clock and log in-out, and a control circuit connected across the first input terminals and the second terminal for providing a clock signal as input from said second terminal when said mode signal designates the clock mode, providing log in data as input from said second terminal when said mode

signal designates the log in mode and providing log out data as output from said second terminal when said mode signal designates the log out mode;

a clock distribution circuit having third input terminals for inputting the mode signal, a fourth input terminal for inputting a clock signal, fifth input terminals for inputting a circuit selection signal to select one of the sequential logic circuits, a plurality of sixth terminals for clock and log in-out, said sixth terminals corresponding to each of said sequential logic circuits, a seventh input terminal for inputting log in data, an eighth output terminal for outputting log out data, and a control circuit comprising a mode decoder connected to the first input terminals, said mode decoder having a plurality of outputs, a selection decoder connected to the fifth input terminals, said selection decoder having a plurality of outputs, and a plurality of gate circuits each corresponding to a respective one of the sequential logic circuits, each of the gate circuits being connected to each of the selection decoder outputs and to a corresponding one of the sixth terminals, said gate circuits being connected to the fourth input terminal, the seventh input terminal, the eighth output terminal and the mode decoder outputs in common;

a plurality of bidirectional lines each connecting a corresponding one of the sixth terminals of the clock distribution circuit to the second terminal of a corresponding one of the sequential logic circuits; and

a mode designation signal lead connecting the first input terminal of said clock distribution circuit to each of said sequential logic circuits in common.

4,145,750

FIELD ACCESS MAGNETIC BUBBLE MEMORY DEVICE

Shigeru Yoshizawa; Yutaka Sugita, both of Tokorozawa; Nobuo Saito, Mitaka; Yuji Arai, Fujisawa, and Nakahiko Yamaguchi, Sayama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Public Corporation, both of, Japan

Filed Jul. 19, 1977, Ser. No. 816,928
Claims priority, application Japan, Jul. 23, 1976, 51-87262
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—6 **14 Claims**

1. In a field access magnetic bubble memory device comprising a memory chip and an in-plane magnetic field generating means for generating in said memory chip an in-plane magnetic field which cyclically rotates during normal operations of the device and is held without rotating and with the same direction during transient stop and start operations of the device before and after an interrupted state of the device between said normal operations,

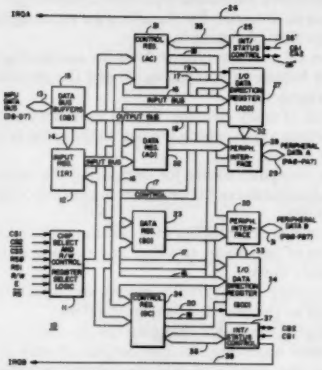
the improvement in that the in-plane field generated by said in-plane field generating means at said transient stop operation has its magnitude which gradually decreases over a period exceeding the ¼ cycle of said normal operation.

4,145,751

DATA DIRECTION REGISTER FOR INTERFACE ADAPTOR CHIP

Earl F. Carlow, Scottsdale, Ariz.; Wilbur L. Mathys, Norristown, Pa.; William D. Mensch, Norristown, Pa.; Charles Peddle, Norristown, Pa., and Michael F. Wiles, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 519,142, Oct. 30, 1974, abandoned.
This application Apr. 18, 1977, Ser. No. 788,184
Int. Cl.[2] G06F *3/04, 13/00*; G11C *9/00*
U.S. Cl. 364—900 **5 Claims**



1. An interface adaptor comprising:

a select input, a read-write input, a plurality of data bus terminals, and a plurality of peripheral data bus terminals;

a control bus, a first bus, and a second bus, each of said buses including, respectively, a plurality of conductors;

control means coupled to said control bus for producing control signals on said conductors of said control bus;

select means responsive to said control means, and having first and second outputs, for producing first and second select signals, respectively, on said first and second outputs in response to said select input;

first buffer means responsive to said control means and to said read-write input and coupled to said data bus terminals, said first bus, and said second bus for transferring information from said data bus terminals to said first bus and for transferring information from said second bus to said data bus terminals;

first storage means responsive to said control means and coupled to said first output of said selection means and to a first conductor of said first bus for storing a bit of select information from said first conductor in response to said first select signal;

second storage means response to said control means and to said first storage means and coupled to said second output of said select means for storing a byte of direction control information received from said first bus in response to a coincidence of said second select signal and the condition that said bit of select information is a first logical state;

second buffer means responsive to said control means and to said second storage means and coupled to said peripheral data bus terminals, said first bus, and said second bus for transferring information from conductors of said first bus to corresponding peripheral data bus terminals and for transferring information from said peripheral data bus terminals to corresponding conductors of said second bus, the direction of each of said transfers of information in said second buffer means being determined by the corresponding bits of said byte of direction control information in said second storage means, said transfers of information in said second buffer means occurring in response to a concurrence of said second select signal and the condition that said bit of select information in a second logical state.

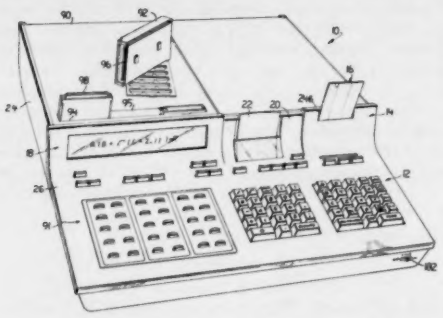
4,145,752
PROGRAMMABLE CALCULATOR INCLUDING SEPARATE LINE NUMBERING MEANS FOR USER-DEFINABLE FUNCTIONS

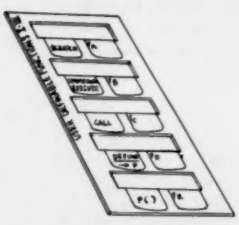
Emil E. Olander, Jr., Fort Collins; Rex J. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,296

Int. Cl.[2] G06F *15/06*

U.S. Cl. 364—709 **3 Claims**





1. An electronic calculator comprising:

keyboard input means for entering lines of alphameric information, including a line number, into the calculator;

memory means, coupled to said keyboard input means, for storing, separately and as part of a mainline program, lines of alphameric information entered into the calculator from said keyboard input means;

processing means, coupled to said keyboard input means and memory means, for processing lines of alphameric information entered into the calculator to perform selected functions; and

output means, coupled to said processing means, for providing an indication of the result of selected functions performed by said processing means;

said keyboard input means including one or more definable keys and means for defining a plurality of functions and subroutines comprising lines of alphameric information and for storing each such defined function and subroutine in said memory means in association with selected ones of said definable keys;

said memory means including a first section for storing the lines of alphameric information comprising the defined functions and subroutines associated with said definable keys, and a second section for storing lines of alphameric information comprising a mainline program;

said processing means including logic means for assigning a sequence of line numbers to the lines of alphameric information comprising each of the defined functions and subroutines stored in the first section of said memory means, each such sequence of line numbers being independent of the sequence of line numbers of every other function and subroutine and independent of a sequence of line numbers associated with the lines of alphameric information stored as a mainline program in the second section of said memory means.

4,145,753
COMPARING APPARATUS FOR VARIABLE LENGTH WORD

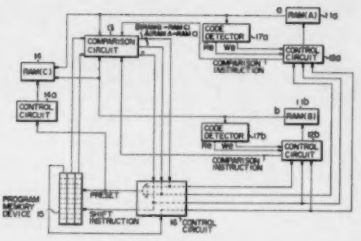
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,522

Claims priority, application Japan, Oct. 20, 1976, 51/125637

Int. Cl.[2] G06F *7/34, 7/28, 13/00*

U.S. Cl. 364—900 **5 Claims**



1. A comparing apparatus for comparing the variable length, comprising information: first and second memory means each for storing record information including a plurality of variable length word information arranged in series fashion with intervention of word boundary codes; first means for specifying the address of at least one word in the record information stored in each of said first and second memory means; second means for directing whether the words specified by said first means are to be compared truing up the most significant digits or the least significant digits; third means for reading out the words specified by said first means and for comparing these words in accordance with the direction by said second means; and fourth means for specifying one of said first and second memory means in accordance with the result of the comparison from said third means and for reading out one record information from said memory means specified.

4,145,754
LINE SEGMENT VIDEO DISPLAY APPARATUS

James Utzerath, 12024 W. Kaul Ave., Milwaukee, Wis. 53225

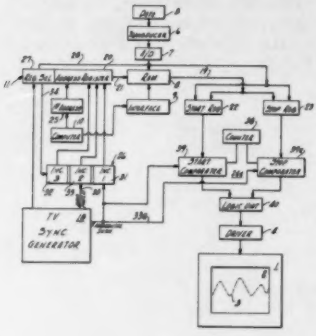
Filed Jun. 11, 1976, Ser. No. 695,100

Int. Cl.[2] G06F *3/14*

U.S. Cl. 364—900 **9 Claims**

1. In a raster type display apparatus having a scanning beam adapted to be turned on and off and a digital memory means including a plurality of storage locations and having a sample and digitizing means for conversion of a live waveform signal into a series of time spaced digitized data and addressing means for placing of live waveform digitized data in said storage locations, said addressing means being repetitive and replacing old waveform digitized data with new digitized data to permit a capture of a continuing live waveform and said data being stored as encoded data values with sequential locations defining sequential portions of the waveforms, and said data values defining start and stop data for generating a line segment display on a display tube means, comprising an interleaving scan line driver means developing sequential display frames each of which includes a plurality of scan lines of the scanning beam, with sequential frames offset to interleave the scan lines of sequential frames, display control means including addressing

means for addressing said storage locations and reading means for reading said memory means for obtaining the start data and the stop data, said control means including means utilizing the start data value for determining the proper location of beam turn-on to control turn on of the display at the position within the display tube means in accordance with the start data and utilizing the stop data value for determining the proper location of beam turn-off to control turn off of the display beam at the position within the display tube means in accordance with the stop data for reproducing the portion of the waveform and connected to said driver means for developing said line segments for each scan line in said display, and said display addressing means including data location selection means to increment the memory storage location being read for stop



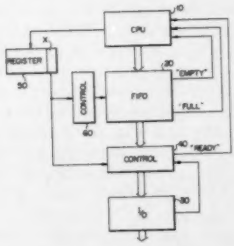
data by a first preselected number of storage locations from the location of the start data whereby during each line the starting location and stopping location are separated by more than one sequential data location, said data location selection means incrementing the start data location of alternate frames by a second preselected number of locations less than said first preselected number to locate the starting point of successive line segments in accordance with the data value of the starting location and between the starting and stopping points of the adjacent line segments of the interleaved frames and thereby forming a line segment waveform of the continuous waveform data with adjacent line segments overlapped, the degree of overlap varying with and controlled by the data values of the storage locations.

4,145,755

INFORMATION TRANSFERRING APPARATUS

Seigo Suzuki, Yokohama; Seiji Eguchi, Kawasaki, and Yoshiaki Moriya, Inagi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 15, 1976, Ser. No. 732,966
Claims priority, application Japan, Oct. 15, 1975, 50-123236
Int. Cl.[2] G06F *3/00, 13/00*
U.S. Cl. 364—900 **4 Claims**



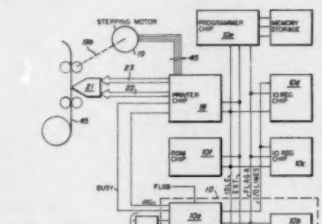
1. An information transferring system comprising first and second information processing units, a data buffering first-in first-out stack connected between said first and second information processing units for transferring data therebetween, means for supplying to said first information processing unit from said first-in first-out stack a "FULL" signal when said first-in first-out stack is fully stored with information data, means for supplying to said first information processing unit from said first-in first-out stack an "EMPTY" signal when no information data is stored in said first-in first-out stack, a first control unit connected to said first and second information processing units for supplying to said first information processing unit a "READY" signal indicating that said second information processing unit is in an operable state for accepting information, said first information processing unit including means responsive to said "EMPTY" signal to permit data transfer from said first information processing unit to said first-in first-out stack and means for providing a control signal upon simultaneous receipt of both said "FULL" and "READY" signals, a command register connected to said first information processing unit which is set to a predetermined bit state in response to said control signal from said first information processing unit, and a second control unit connected between said command register and said first-in first-out stack for supplying an output signal to said first-in first-out stack in response to the predetermined bit state of said command register to permit data transfer from said first-in first-out stack to said second information processing unit.

4,145,756

THERMAL LINE PRINTER

Michael J. Cochran, Richardson, and Stephen P. Hamilton, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 428,492, Dec. 26, 1973, Pat. No. 4,020,465.
This application Dec. 6, 1976, Ser. No. 748,076
Int. Cl.[2] G08B *5/36*
U.S. Cl. 364—900 **14 Claims**



1. A thermal printing system for actuating a plurality of groups of thermal printing elements, said elements in each one of said groups being correspondingly disposed to provide a character representation upon actuation of selected elements, said system comprising:

(a) first means for storing a plurality of data words representing the characters to be printed;

(b) second means for converting said plurality of data words into a plurality of character printing codes and for reading out a selected bit from each of said codes;

(c) third means for actuating selected elements in response to the state of the selected bit from each of said codes; and

(d) sequencer means, operatively connected to said second

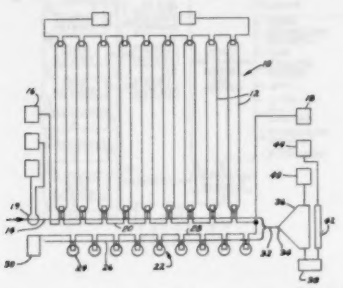
means, for sequentially selecting a different bit to be read from said codes each time the plurality of words is converted by said second means.

4,145,757

FAULT TOLERANT BUBBLE MEMORY WITH REDUNDANCY USING A STATIONARY REGISTER ON A SINGLE CHIP

G. Patrick Bonnie, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 12, 1977, Ser. No. 841,505
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—17 **2 Claims**



1. A fault tolerant bubble memory device comprising, in a field access type bubble memory system using major loop-minor loop configuration, additional redundant minor loops, all minor loops being associated with a single major loop, so that defective minor loops may be disregarded and retain nominal memory capacity,

a stationary register having as many register positions as the total number of minor loops placed parallel to and adjacent to the major loop in a position shifted location

said stationary register being comprised of a serial propagation track whereby bubble elements move from one location to another in the presence of a rotating in-plane magnetic field, a pattern of idler elements placed in an array form parallel and adjacent to said propagation track and an electrical conductor generally following the path of said propagation track and having associated with each idler element a current loop of said conductor such that pulses of current in said conductor may control transfer of bubbles between said propagation track and said idlers, and

a merge device coupled with said major loop and said register so that the contents of said register and said major loop may be merged on an every other one basis.

4,145,758

ERROR CHECKING METHOD AND APPARATUS FOR DIGITAL DATA IN OPTICAL RECORDING SYSTEMS

Jerome Drexler, Los Altos Hills, and Carl R. Betz, Los Altos, both of Calif., assignors to Drexler Technology Corporation, Palo Alto, Calif.

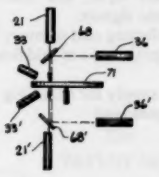
Filed Oct. 25, 1977, Ser. No. 845,332
Int. Cl.[2] G11C *29/00, 13/04*
U.S. Cl. 365—200 **30 Claims**

28. A method of recording and error checking optical pulses on an optical recording medium comprising,

directing optical pulses from a light source at an optical recording medium which is light transmissive prior to recording data,

detecting optical energy directed toward said recording medium and detecting optical energy transmitted through said recording medium,

generating corresponding first and second electrical signals indicative of the energy received from said pulses, and



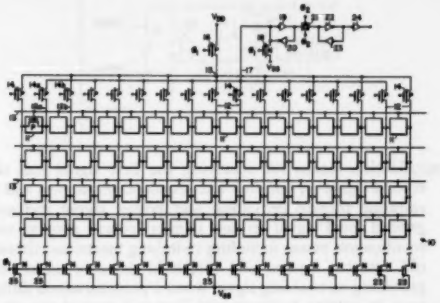
correlating said first and second electrical signals for signalling data errors in writing on said recording medium.

4,145,759

VIRTUAL POWER SUPPLY ROM

James J. Remedi, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1978, Ser. No. 895,848
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—203 **14 Claims**



4. A read-only-memory having a large number of memory cells arranged in an array of rows and columns of cells, the columns being defined by vertical lines and the rows being defined by horizontal lines, comprising: a first node being coupled to a predetermined number of the vertical lines to provide only one vertical line being coupled to the first node and being adjacent to each column of cells; first means for precharging the first node to a first voltage potential, the first means being coupled between the first node and a first voltage potential node; second means for coupling the predetermined number of vertical lines to the first node; an output node for providing an output from the memory cells, the output node being coupled to vertical lines which define a second side of the columns opposite to a first side defined by the predetermined number of vertical lines; and third means for precharging the vertical lines to a second voltage potential, the third means being coupled between the vertical lines and a second voltage potential node.

4,145,760

MEMORY DEVICE HAVING A REDUCED NUMBER OF PINS

William P. Ward, and Donald K. Lauffer, both of Poway, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 11, 1978, Ser. No. 895,328
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—226 **12 Claims**

10. In a memory device in the form of an integrated circuit structure:

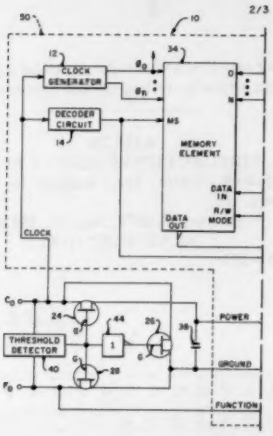
a first pin for receiving a first synchronizing signal;

means for detecting a change in said first synchronizing signal for enabling said memory device;

a second pin for receiving a second signal, including memory address, data input, and internally-generated data output component signals;

means for mode selecting said memory device in response to a mode select signal at one of said first and second external pins;

an internal power supply for receiving a power signal and a ground level signal; and



rectification means for receiving the first signal and the second signal on said first and second external pins and in response thereto providing said power signal and said ground level signal to said internal power supply, said rectification means including switching means and threshold detector means, said threshold detector means for providing an enabling signal when a predetermined difference in voltage between said first and second signals is sensed, said switching means for receiving said enabling signal and in response thereto for operatively connecting said first and second external pins to said power supply.

4,145,761

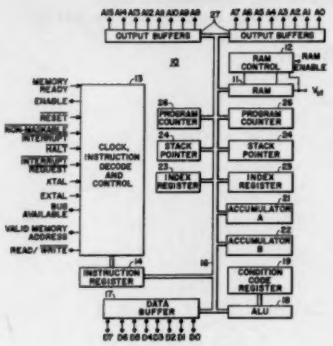
RAM RETENTION DURING POWER UP AND POWER DOWN

Thomas G. Gunter; Fuad H. Musa; Pern Shaw, all of Austin, and Michael F. Wiles, Rount Rock, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 9, 1978, Ser. No. 884,790

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—227 **8 Claims**



5. A RAM having control circuitry to save at least a portion of the information stored in the RAM during power-up and power-down of other circuitry located on the same integrated circuit chip with the RAM, the other circuitry including a microprocessor, the RAM and control circuitry being powered by a standby supply, and comprising: a latch to hold an input signal just prior to power-down to just after power-up, the latch having an output; read and write logic being coupled to the latch and being inhibited by the output of the latch to inhibit the read and write logic from disturbing the at least a portion of the information stored in the RAM; and means coupled to the latch and controlled by the latch, the means also being coupled to at least a plurality of word select lines of the RAM and being capable of preventing addressing the at least a portion of the RAM being saved.

DESIGN PATENTS

GRANTED MAR. 20, 1979

ERRATA

For CLASS	See PATENT NO.
D21–157	251,393
D21–153	251,394
D21–037	251,395

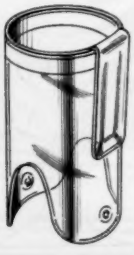
DESIGNS

MARCH 20, 1979

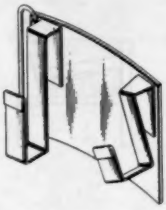
251,336
VISOR CAP
William F. Getgey, 2191 Victory Parkway, Cincinnati, Ohio 45206
Filed Aug. 15, 1977, Ser. No. 824,992
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—247

251,337
BOWLING GLOVE
Richard H. Coon, Hopkinsville, Ky., assignor to National Athletic Supply Corp., Paramus, N.J.
Filed Jul. 14, 1977, Ser. No. 815,866
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

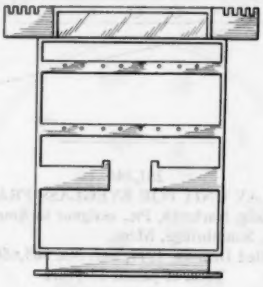
251,338
MULTIPLE BALL CADDIE
Harold Evans, 3403 Corona St., Tampa, Fla. 33609; Curtis L. Anderson, 1018 W. Peninsular St., Tampa, Fla. 33603, and Daniel Evans, 11696 Leisure La., Largo, Fla. 33540
Filed Dec. 30, 1976, Ser. No. 758,545
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



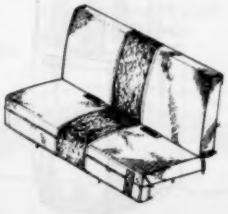
251,339
BELT BUCKLE HOLSTER
Richard F. Tulak, Burbank, Calif.
Filed Feb. 14, 1977, Ser. No. 768,388
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—406



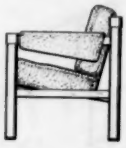
251,340
JEWELRY ORGANIZER
Andy Strasser, Paramus, N.J., assignor to Astra Products, Inc., Carlstadt, N.J.
Filed Apr. 18, 1978, Ser. No. 897,654
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28



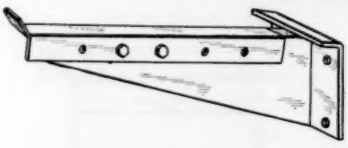
251,341
AUTOMOBILE SEAT COVER OR SIMILAR ARTICLE
Alberta Bodrero, Logan, Utah, assignor to Alco Seat Covers, Inc., Logan, Utah
Filed May 27, 1977, Ser. No. 801,296
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—48



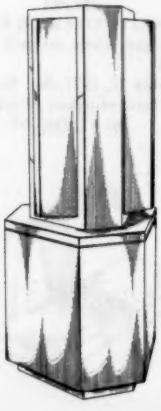
251,342
SEAT
Harold Glaser, St. Louis County, Mo., assignor to James David Incorporated, Maryland Heights, Mo.
Filed Mar. 30, 1977, Ser. No. 782,982
The portion of the term of this patent subsequent to Mar. 28, 1992, has been disclaimed.
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—73



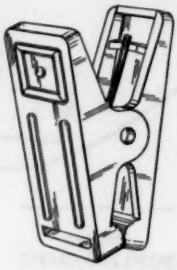
251,343
HOSE HANGER
Carl A. Hansen, P.O. Box 7036, Chattanooga, Tenn. 37410
Filed Sep. 26, 1977, Ser. No. 836,485
Term of patent 14 years
Int. Cl. D6—*04;* D8—*08*
U.S. Cl. D6—112



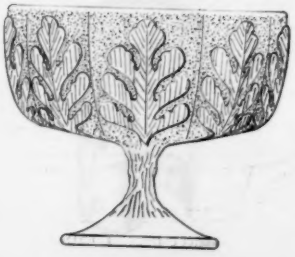
251,344
DISPLAY UNIT FOR EYEGLASS FRAMES
Stephen U. Winig, Narberth, Pa., assignor to American Optical Corporation, Southbridge, Mass.
Filed Dec. 29, 1977, Ser. No. 865,650
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—146



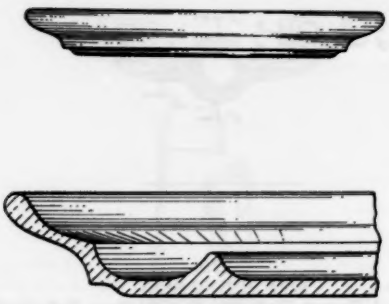
251,345
GARMENT HANGER CLIP
Jerome J. Bigelow, Bethel, Conn. and Jeffrey A. Bigelow, Rt. 53, West Redding, Conn., assignors to Jeffrey Alan Bigelow
Filed Oct. 25, 1977, Ser. No. 845,149
Term of patent 14 years
Int. Cl. D6—*08;* D7—*05;* D8—*08*
U.S. Cl. D6—257



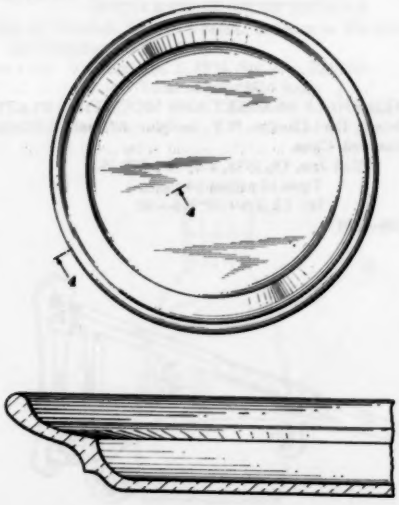
251,346
COMPOTE
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association
Filed May 17, 1976, Ser. No. 687,186
The portion of the term of this patent subsequent to Feb. 14, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—22



251,347
SAUCER
Niels R. Andersen, Rude, Denmark, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed Jun. 1, 1977, Ser. No. 802,386
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—23



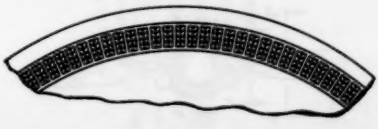
251,348
PLATE
Niels R. Andersen, Rude, Denmark, assignor to Dansk International Designs Ltd.
Filed Jun. 1, 1977, Ser. No. 802,387
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—23



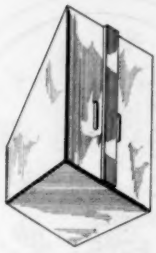
251,349
PLATE OR THE LIKE
Estelle G. Rothstein, Corning, N.Y., assignor to Corning Glass Works
Filed Jan. 19, 1977, Ser. No. 760,641
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—35

251,350
PLATE OR THE LIKE
Cynthia S. Gerow, Ballston Spa, N.Y., assignor to Corning Glass Works
Filed Feb. 7, 1977, Ser. No. 765,956
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—35

251,351
PLATE OR THE LIKE
Ottorino N. Mercadante, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Mar. 21, 1977, Ser. No. 779,946
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—36



251,352
BOTTLE CONTAINER
Joseph M. Menius, 4302 Barth Dr., St. Louis, Mo. 63125
Filed Oct. 6, 1976, Ser. No. 730,061
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70

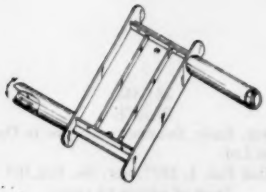


251,353
PULL
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Jun. 20, 1977, Ser. No. 807,840
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—315

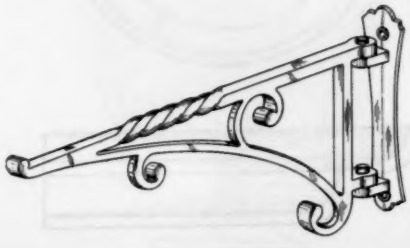
251,354
PULL
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Mar. 27, 1978, Ser. No. 890,711
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—318

251,355
PULL
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Mar. 27, 1978, Ser. No. 890,713
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—319

251,356
KITE STRING REEL
Henri M. J. Bogaert, Kinderdijk 30, Middelburg, Netherlands
Filed Mar. 10, 1976, Ser. No. 665,534
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D8—358



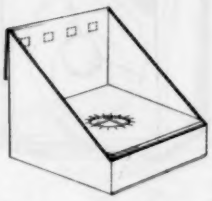
251,357
COMBINED SHELF BRACKET AND MOUNTING PLATE
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 18, 1978, Ser. No. 870,494
Term of patent 14 years
Int. Cl. D8—*08;* D6—*06*
U.S. Cl. D8—381



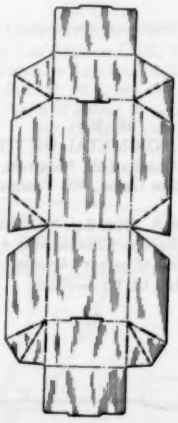
251,358
BOTTLE OR THE LIKE
Ronald R. Gutkowski, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Feb. 7, 1977, Ser. No. 766,159
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—39

251,359
BOTTLE OR SIMILAR ARTICLE
Guy A. Turnbull, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Jul. 2, 1976, Ser. No. 702,255
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

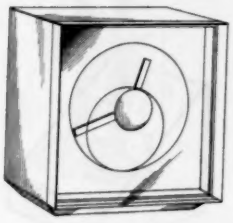
251,360
COMBINED SHIPPING AND DISPLAY CONTAINER FOR CUT FLOWERS
Herbert S. Collin, Newton, Mass.
Filed Jun. 28, 1976, Ser. No. 700,341
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—221



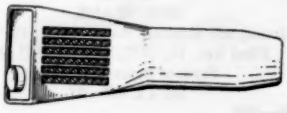
251,361
BOX BLANK
Gary L. Adreon, 250 Kristina, Bourbonnais, Ill. 60914
Filed Apr. 14, 1977, Ser. No. 787,669
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



251,362
CLOCK
James L. Hamilton, 189 Upland Rd., and Jordan Kirsch, 78 Huron Ave., both of Cambridge, Mass. 02138
Filed Mar. 17, 1977, Ser. No. 778,494
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—25

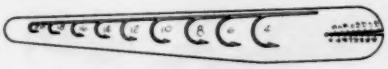


251,363
DETECTOR FOR METAL OR THE LIKE
André Hénault, 2060 Charles-Gill, Montreal, Quebec, Canada (H3M 1V4), and Gilles Garon, 408 Vauquelin, Beloeil, Quebec, Canada
Filed Oct. 8, 1976, Ser. No. 730,970
Claims priority, application Canada, May 4, 1976, 0405761
Term of patent 14 years
Int. Cl. D10—*04, 05*
U.S. Cl. D10—47

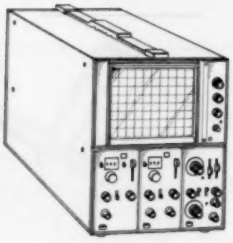


251,364
DETECTOR FOR METAL OR THE LIKE
André Hénault, 2060 Charles-Gill, Montreal, Quebec, Canada (H3M 1V4), and Gilles Garon, 408 Vauquelin, Beloeil, Quebec, Canada
Filed Oct. 8, 1976, Ser. No. 730,971
Claims priority, application Canada, May 4, 1976, 04-05-76-2
Term of patent 14 years
Int. Cl. D10—*04, 05*
U.S. Cl. D10—47

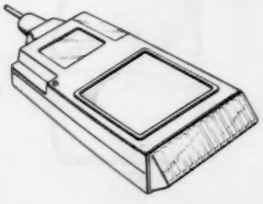
251,365
COMBINED HOOK AND LINE GAUGE
Robert C. Lipinski, 627 S. Rembrandt, Royal Oak, Mich. 48067
Filed Apr. 21, 1977, Ser. No. 789,677
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



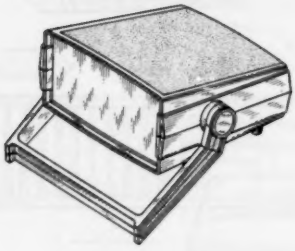
251,366
ELECTRONIC TEST INSTRUMENT
Robert H. Bathiany, San Jose, and Bernhard Jensen, Mountain View, both of Calif., assignors to Wiltron Company, Mountain View, Calif.
Filed Mar. 14, 1977, Ser. No. 776,822
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—76



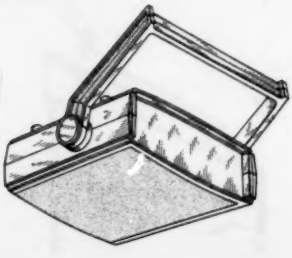
251,367
ELECTRICAL CONTINUITY AND VOLTAGE TESTER
Dan Tucker, Los Angeles, Calif., assignor to Mono-Probe Corporation, Las Vegas, Nev.
Filed Dec. 30, 1976, Ser. No. 755,571
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



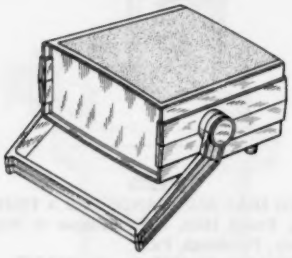
251,368
ELECTRONIC INSTRUMENT CASE
Fred L. Katzmann, Cedar Grove, N.J., and Dale W. Gruye, Portola Valley, Calif., assignors to Ballantine Laboratories, Inc., Boonton, N.J.
Filed Jan. 17, 1977, Ser. No. 759,667
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—80



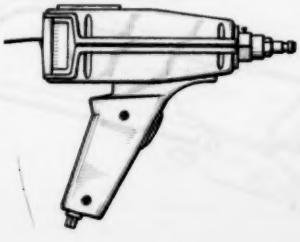
251,369
ELECTRONIC INSTRUMENT CASE
Fred L. Katzmann, Cedar Grove, N.J., and Dale W. Gruye, Portola Valley, Calif., assignors to Ballantine Laboratories, Inc., Boonton, N.J.
Filed Jan. 17, 1977, Ser. No. 759,724
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—80



251,370
ELECTRONIC INSTRUMENT CASE
Fred L. Katzmann, Cedar Grove, N.J., and Dale W. Gruye, Portola Valley, Calif., assignors to Ballantine Laboratories, Inc., Boonton, N.J.
Filed Jan. 17, 1977, Ser. No. 759,725
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—80

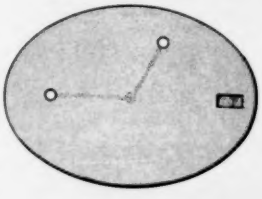


251,371
COMPRESSION TESTER
Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.
Filed Jun. 24, 1977, Ser. No. 809,933
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—85

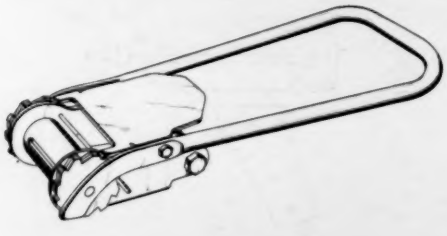


251,372
GLARE SCREEN BLADE
Charles W. Syak, Girard, Ohio, assignor to Syro Steel Company, Girard, Ohio
Filed Aug. 31, 1977, Ser. No. 829,524
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

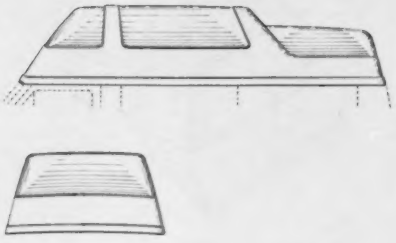
251,373
COMBINED DIAL AND HANDS FOR A TIMEPIECE
Helmut Herz, Forest Hills, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Sep. 15, 1975, Ser. No. 613,727
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—124



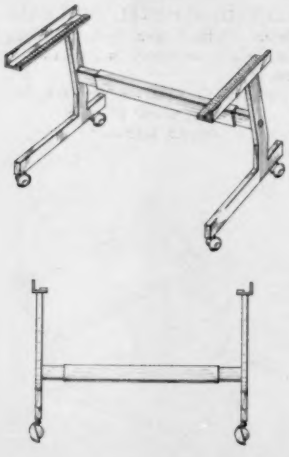
251,374
WINCH
Oskar L. Lindblad, Hedåsgatan 16, Vårgårda, and Leif Ennerdal, Glimmergatan 16, Alingsås, both of Sweden
Filed Jun. 7, 1977, Ser. No. 804,299
Claims priority, application Sweden, Dec. 9, 1976, 762399
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—54



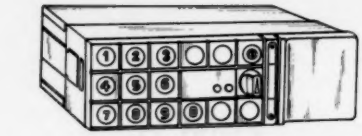
251,375
ORNAMENTAL DESIGN FOR A TOP FOR A CAMPING VEHICLE
Horst Knöbel, Rheda-Wiedenbrück, Fed. Rep. of Germany, assignor to Westfalia-Werke Franz Knobel & Söhne KG, Wiedenbrück, Fed. Rep. of Germany
Filed Nov. 23, 1977, Ser. No. 854,227
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 980
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

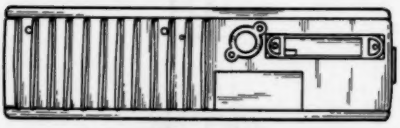


251,376
MUSIC CENTER STAND
Harry Brodmann, Flat 4, Washington House, 81 Finchfield Rd. West, Finchfield/Wolverhampton, West Midlands, England
Filed Mar. 31, 1977, Ser. No. 783,419
Claims priority, application United Kingdom, Jan. 13, 1977, 978534/77
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—38

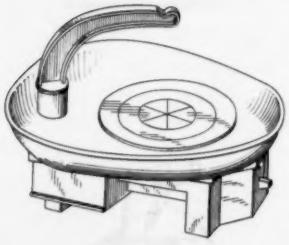


251,377
COMMUNICATION RADIO SET
Jan E. Örn, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Apr. 27, 1977, Ser. No. 791,384
Claims priority, application Sweden, Nov. 10, 1976, 762164
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

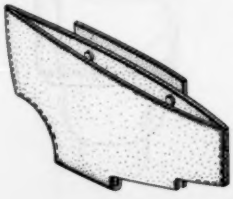




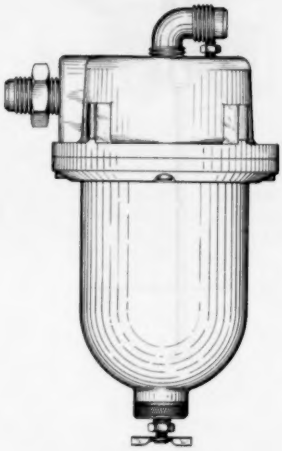
251,378
POTTER'S WHEEL
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Jun. 17, 1977, Ser. No. 807,595
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D19—35

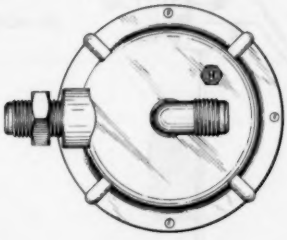


251,379
BELT HOLSTER
Richard F. Tulak, 274 E. Verdugo Ave., Burbank, Calif. 91502
Filed Feb. 14, 1977, Ser. No. 768,351
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



251,380
FILTER
Jordi Casamitjana, 3a. Cerrada de Camino de Minas No. 139, Lomas de Becerra, Mexico (18, D. F.)
Filed Dec. 10, 1976, Ser. No. 749,498
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4





251,381

LIQUID SPRAYER

William J. Reed, Wythall, England, assignor to ASL/Airflow Limited, Birmingham, England

Filed Nov. 30, 1977, Ser. No. 856,165

Claims priority, application United Kingdom, Sep. 30, 1977, 981738/77

Term of patent 14 years

Int. Cl. D23—01

U.S. Cl. D23—17

251,382

COMBINED SPRAYER AND CONTAINER

William J. Reed, Wythall, England, assignor to ASL/Airflow Limited, Birmingham, England

Filed Nov. 30, 1977, Ser. No. 856,164

Claims priority, application United Kingdom, Sep. 30, 1977, 981739/77

Term of patent 14 years

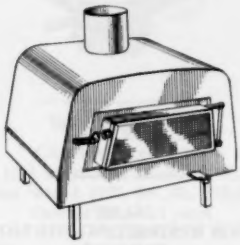
Int. Cl. D23—01

U.S. Cl. D23—18

251,383
BUTTERFLY VALVE
George E. Hansen, Elmwood Park, and John A. McInerney, Evergreen Park, both of Ill., assignors to Crane Co., New York, N.Y.
Filed May 18, 1977, Ser. No. 798,267
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

251,384
STOVE
J. Burrell Chase, 357 Los Gatos Blvd., Branscomb, Calif. 95030
Filed Feb. 22, 1977, Ser. No. 770,909
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

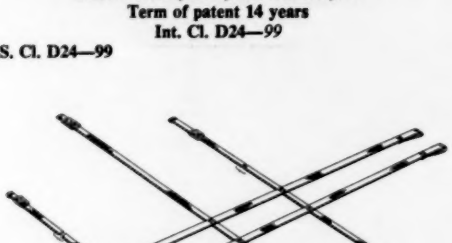
251,385
FIREPLACE STOVE
Ernest C. Zimmer, R.D. #2, Wellsburg, N.Y. 14894
Filed Sep. 13, 1977, Ser. No. 833,010
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



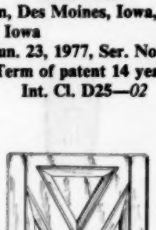
251,386
HANDLE FOR DENTAL ROOT-CANAL BROACHES AND LIKE ARTICLES
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A.
Filed Mar. 29, 1977, Ser. No. 782,566
Claims priority, application France, Feb. 22, 1977, 77.1140
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

251,387
ELECTRICAL CONNECTOR FOR ELECTROCARDIOGRAM MONITORING
Donald C. Ramsay, Braintree, and James M. Tantillo, Brockton, both of Mass., assignors to Component Manufacturing Service, Inc., West Bridgewater, Mass.
Filed Feb. 7, 1977, Ser. No. 766,341
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D24—29

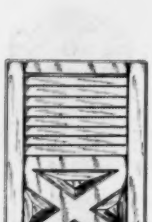
251,388
RESTRAINT FOR RESTRICTING THE MOVEMENT OF PERSONS
John E. Burns, Seaford, and Martin J. Van Lith, Kew, both of Australia, assignors to Alfred Hospital, Prahran, Australia
Filed Nov. 29, 1977, Ser. No. 855,915
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99



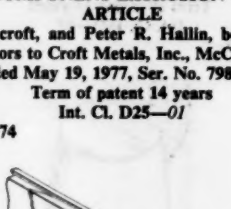
251,389
SHUTTER
Lawrence B. Engman, Des Moines, Iowa, assignor to Engmans, Inc., Des Moines, Iowa
Filed Jun. 23, 1977, Ser. No. 809,197
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—47



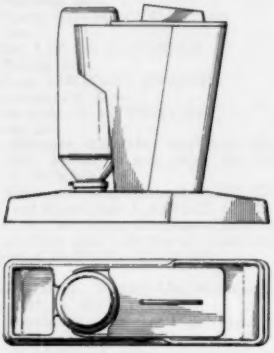
251,390
SHUTTER
Lawrence B. Engman, Des Moines, Iowa, assignor to Engmans, Inc., Des Moines, Iowa
Filed Jun. 23, 1977, Ser. No. 809,198
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—47



251,391
WINDOW COMPONENT EXTRUSION OR SIMILAR ARTICLE
Joseph C. Bancroft, and Peter R. Hallin, both of McComb, Miss., assignors to Croft Metals, Inc., McComb, Mich.
Filed May 19, 1977, Ser. No. 798,693
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



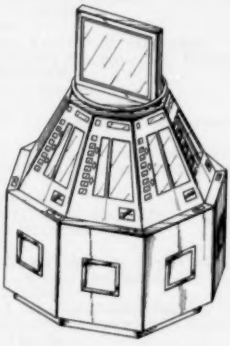
251,392
AUTOMATIC FEEDER FOR PETS
Lionel H. Futers, 10 Lenham Rd., East Rottingdean, Brighton, East Sussex, and Robert P. Beaumont, 9 Outlook Ave., Peacehaven, East Sussex, both of England
Filed Dec. 29, 1976, Ser. No. 758,024
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



251,393
STUFFED ANIMAL
Gladys S. O'Linger, Rte. 2, Box 251, Berlin, Md. 21811
Filed Mar. 23, 1977, Ser. No. 780,548
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—157

251,394
PUPPET OR SIMILAR ARTICLE
Steven A. Beaudry, 16170 Olivine NW, Anoka, Minn. 55303
Filed Jun. 20, 1977, Ser. No. 808,252
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—153

251,395
GAMING MACHINE
Lewis A. Kula, 1341 North Ave., Elizabeth, N.J. 07208
Filed Mar. 2, 1977, Ser. No. 773,620
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—37



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF MARCH, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Bofors: *See—*
Berge, Sven E.; and Hultgren, K. Sten R., 4,144,797, Cl. 89-41.00M.

AB Holmbom & Hedlund: *See—*
Lundqvist, Gunnar, 4,144,982, Cl. 414-666.000.

AB Lectrostatic: *See—*
Alskog, Magnus, 4,145,196, Cl. 55-380.000.

AB Platslageriet Rostfri: *See—*
Carlsson, Richard, 4,145,604, Cl. 219-439.000.

Abbott/Interfast Corporation: *See—*
De Haitre, Lon, 4,145,107, Cl. 339-263.00R.

Abbott Laboratories: *See—*
Iida, Takao; Shirahata, Kunikatsu; Maisubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,145,253, Cl. 195-96.000.
Matsushima, Hideo; and Mori, Yasuki, 4,145,530, Cl. 536-17.000.
Winn, Martin; and Kyncl, John J., 4,145,422, Cl. 424-250.000.

Abdoo, Richard V., to Ford Motor Company. Circuit for controlling the operability of one or more cylinders of a multicylinder internal combustion engine. 4,144,863, Cl. 123-198.00F.

Abe, Mitsunobu: *See—*
Gondo, Hisashi; Takechi, Hiroshi; Abe, Mitsunobu; and Namba, Kazuo, 4,145,235, Cl. 148-12.00C.

Abe, Nobuyuki; Watanabe, Osamu; Tominaga, Masami; Nunokawa, Koji; Tanaka, Ichiro; and Manabe, Masao, to Nippon Concrete Industries Co., Ltd. Method of setting a pile without noise or vibration and apparatus therefor. 4,144,942, Cl. 175-286.000.

Abex Corporation: *See—*
Straut, John E., 4,145,164, Cl. 417-252.000.

Abilities Unlimited, Inc.: *See—*
Harris, Scott, 4,144,638, Cl. 29-762.000.

Ablad, Bengt A. H.: *See—*
Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., 4,145,442, Cl. 424-330.000.

Abthoff, Jorg; and Schuster, Hans-Dieter, to Daimler-Benz Aktiengesellschaft. Catalyst monolith for exhaust gas decontamination, preferably in motor vehicles. 4,145,394, Cl. 422-179.000.

Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., to Bell Telephone Laboratories, Incorporated. Method and apparatus for cancelling interference between area coverage and spot coverage antenna beams. 4,145,658, Cl. 325-180.000.

Adachi, Kiyoshi: *See—*
Nakamoto, Koichiro; Ohyama, Nobumi; Adachi, Kiyoshi; and Kuwahara, Hajime, 4,144,741, Cl. 73-19.000.

Adamich, Anthony A. Simulated extendable and collapsible evergreen tree. 4,145,731, Cl. 362-123.000.

Adams, Bruce E.; Hensel, Robert D.; and Quinn, Edwin J., to Armstrong Cork Company. Heat resistant curable surface coating composition comprising the reaction product of an unsaturated polyaryloxyphosphazene and an unsaturated aryloxycyclotriphosphazene. 4,145,479, Cl. 428-500.000.

Addicks, Lyle F. Bicycle sprocket wheel. 4,144,773, Cl. 74-243.0DR.

Adsetts, John R., to Imperial Chemical Industries Limited. Process for the preparation of plural metal crystalline compounds. 4,145,400, Cl. 423-419.00P.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Bonnemay, Maurice; Bronoel, Guy; Maximovitch nee Fabre, Suzanne; and Sarradin, Joel, 4,145,483, Cl. 429-103.000.
Gaechter, Jean-Pierre; Bourdeau, Charles; and Vialaret, Guy, 4,145,021, Cl. 248-371.000.
Mingot, Claude M., 4,145,154, Cl. 404-81.000.

Agfa-Gevaert, N.V.: *See—*
Timmerman, Daniel M.; De Winter, Walter F.; and Van Hoof, Albert E., 4,145,220, Cl. 96-84.00A.

Agulnek, Harry: *See—*
Mishcon, Lester, deceased; and Agulnek, Harry, 4,144,726, Cl. 66-140.00R.

Air Products and Chemicals, Inc.: *See—*
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,145,525, Cl. 528-404.000.

Aizawa, Hiroshi: *See—*
Shimizu, Masami; Aizawa, Hiroshi; Yamamichi, Masayoshi; Iura, Yukio; Uchidoi, Masanori; and Tsunekawa, Tokuichi, 4,145,130, Cl. 354-51.000.

Akebono Brake Industry Co., Ltd.: *See—*
Nakayama, Tsuneo, 4,144,952, Cl. 188-73.300.

Akers, Larry D.; Scholl, Charles H.; Smith, Joseph S.; and Williams, Edward A., to Nordson Corporation. Hot melt adhesive dispensing system of the hand held gun type. 4,144,913, Cl. 141-2.000.

Aki, Osami: *See—*
Ochiai, Michihiko; Morimoto, Akira; Aki, Osami; and Okada, Taiiti, 4,145,540, Cl. 544-21.000.

Akiyama, Takashige: *See—*
Ichiyanagi, Takashi; Akiyama, Takashige; and Otoda, Ichizo, 4,144,838, Cl. 118-125.000.

Akselrad, Edward D.; and Akselrad, Stanley A. Cutting apparatus. 4,144,641, Cl. 30-289.000.

Akselrad, Stanley A.: *See—*
Akselrad, Edward D.; and Akselrad, Stanley A., 4,144,641, Cl. 30-289.000.

Aktiebolaget Atomenergi: *See—*
Linder, Sten V., 4,144,756, Cl. 73-290.00R.

Aktiebolaget Hassle: *See—*
Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., 4,145,442, Cl. 424-330.000.

Aktieselskabet de Danske Sukkerfabrikker: *See—*
Madsen, Rud F.; Knovl, Ernst; Moller, Gunther R.; and Nielsen, Werner K., 4,145,230, Cl. 127-60.000.

Akzona Incorporated: *See—*
Endstra, Willem C., 4,145,505, Cl. 528-10.000.
Franks, Neal E.; and Varga, Julianna K., 4,145,532, Cl. 536-56.000.
van der Burg, Willem J., 4,145,434, Cl. 424-274.000.

Alagy, Jacques; and Dang Vu, Quang, to Institut Francais du Petrole. Process for manufacturing terephthalic acid by oxidation of paraxylene. 4,145,560, Cl. 562-412.000.

Alb. Klein KG: *See—*
Bastgen, Wendel, 4,144,807, Cl. 100-118.000.

Albrechtsen, Kaj, to GNT Automatic A/S. Pushbutton arrangement. 4,145,589, Cl. 200-159.00R.

Albright & Wilson Limited: *See—*
Cole, Robert, 4,145,463, Cl. 427-337.000.

Alderman, Robert J. Liquid metering funnel apparatus. 4,144,916, Cl. 141-105.000.

Aldridge, David C.; Crawley, Graham C.; and Strawson, Colin J., to Imperial Chemical Industries Limited. Hydroxy acids. 4,145,437, Cl. 424-279.000.

Alexander, Donald E.: *See—*
Wagaman, Neil D.; Meeks, Hatcher R.; and Alexander, Donald E., 4,145,384, Cl. 261-35.000.

Alexander, John: *See—*
Dholakia, Anil R.; and Alexander, John, 4,145,718, Cl. 358-128.000.

Alexander, Robert L., to Hunt Manufacturing Co. Article of furnishing. 4,145,098, Cl. 312-257.0SM.

Alldredge, Robert L.; and VanLingen, Eduard W., to Alldredge, Robert L. Flexible conveyor track assembly. 4,144,965, Cl. 198-831.000.

Allen Group, Inc., The: *See—*
Scourtes, George, 4,144,960, Cl. 198-339.000.

Allen, Richard W.; and Jackson, Alexander, III, to RCA Corporation. Frequency activated circuit. 4,145,660, Cl. 328-138.000.

Allen, Thomas S.: *See—*
Zorzi, Paul A.; Allen, Thomas S.; and Kucsma, Michael E., 4,145,330, Cl. 260-37.00R.

Allied Chemical Corporation: *See—*
Millray, Robert, 4,144,917, Cl. 141-311.00R.
Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,145,502, Cl. 526-255.000.
Segal, Leon; and Steinberg, Albert H., 4,145,227, Cl. 106-288.00B.
Sweeney, Richard F.; and Sukornick, Bernard, 4,145,368, Cl. 260-653.000.

Alps Electric Co., Ltd.: *See—*
Iwasaki, Sadayoshi, 4,145,585, Cl. 200-11.0DA.

Alskog, Magnus, to AB Lectrostatic. Filter element. 4,145,196, Cl. 55-380.000.

Aluma Building Systems Incorporated: *See—*
Avery, Peter J., 4,144,690, Cl. 52-376.000.

Amada Company, Limited: *See—*
Yamazaki, Kazuya; and Yonekura, Mikio, 4,144,783, Cl. 83-216.000.

Amagami, Keizo: *See—*
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,145,592, Cl. 219-10.49R.

Aman, Herbert: *See—*
Kipp, Dieter; Aman, Herbert; and Hansen, Rudolf, 4,145,640, Cl. 318-139.000.

American Can Company: *See—*
Kuckenbecker, Morris W., 4,144,996, Cl. 229-33.000.
Weyenberg, Robert J.; and Seidler, Don W., 4,145,001, Cl. 239-56.000.

American Cyanamid Company: *See—*
Pasarela, Nunzio R., 4,145,409, Cl. 424-16.000.

Robinson, Peter M.; Coville, Michael W. C.; and Dexter, Robin W., 4,145,495, Cl. 526-93.000.

American Hospital Supply Corporation: *See—*
Olsen, Robert A., 4,144,644, Cl. 32-22.000.

AMF Incorporated: *See—*
Fice, Joseph V., 4,144,895, Cl. 131-143.000.
Schmidt, Otto K.; and Taylor, Robert P., 4,144,894, Cl. 131-17.0AC.

AMP Incorporated: *See—*
Tucci, John J., 4,144,633, Cl. 29-566.300.

Ampex Corporation: *See—*
Gallo, Luigi C., 4,145,704, Cl. 358-8.000.

Anchor Hocking Corporation: *See—*
Travis, Jack R., 4,144,995, Cl. 229-15.000.

Andco Industries, Inc.: *See—*
Bruckenstein, Stanley, 4,145,282, Cl. 210-46.000.

Andersen, Harold W., to H. W. Andersen Products Inc. Sterilization detection device and method. 4,145,186, Cl. 23-232.00R.

Anderson, Alan J.; and Hargreaves, Anthony R. Air ride sleeper for trucks. 4,144,601, Cl. 5-118.000.

Anderson, Carl M.; and Leonard, Louis H., to Carrier Corporation. Dual flash economizer refrigeration system. 4,144,717, Cl. 62-117.000.

Anderson, Charles H.: *See—*
Peters, Kenneth D.; and Anderson, Charles H., 4,145,633, Cl. 313-422.000.

Anderson Company, The: *See—*
Wubbe, Leo J., 4,144,613, Cl. 15-250.320.

Anderson, John E.; and Kallenberger, Robert H., to Phillips Petroleum Company. Control of multiple fuel streams to a burner. 4,144,997, Cl. 236-15.0BF.

Andersson, Anders O.; and Purves, Robert B., to Boeing Company, The. Apparatus for analyzing complex acoustic fields within a duct. 4,144,768, Cl. 73-646.000.

Andrew, Dennie J.; and Hilton, Avery, Jr. Non-consumable electrode with replaceable graphite tip. 4,145,564, Cl. 13-18.00A.

Angele, Werner; and Welz, Hermann, to Pfaff Industriemaschinen GmbH. Workpiece stacking device for sewing machines. 4,144,825, Cl. 112-121.290.

Angner, Ronald J.; Egan, Wayne J.; Gordon, Alan M.; and Huryn, William A., to Bell Telephone Laboratories, Incorporated. Key telephone unit protective coupler. 4,145,579, Cl. 179-81.00R.

Anic S.p.A.: *See—*
Arrighetti, Sergio; Brancaccio, Aldo; Cesca, Sebastiano; and Giuliani, Giampaolo, 4,145,378, Cl. 260-876.00R.

Aoki, Akio: *See—*
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,145,155, Cl. 404-98.000.

Aplin, George E., Sr., to Posey, Fred R., Jr., a part interest. Drive and steering mechanism for a vehicle. 4,144,944, Cl. 180-6.200.

Applied Power Inc.: *See—*
Clark, Raymond; and Neill, William T., Jr., 4,144,713, Cl. 60-477.000.

Arai, Katsuhiko: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Taniguchi, Yoshiko; Saito, Masumi; and Sakata, Ryozo, 4,145,318, Cl. 521-112.000.

Arai, Soichi: *See—*
Fujimaki, Masao; Arai, Soichi; Watanabe, Michiko; Hashimoto, Yukio; and Kurooka, Akira, 4,145,455, Cl. 426-614.000.

Arai, Yoshinobu: *See—*
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,145,555, Cl. 560-53.000.

Arai, Yuji: *See—*
Yoshizawa, Shigeru; Sugita, Yutaka; Saito, Nobuo; Arai, Yuji; and Yamaguchi, Nakahiko, 4,145,750, Cl. 365-6.000.

Araki, Yasushi: *See—*
Muranaka, Shigeo; Takagi, Yasuo; Araki, Yasushi; and Kakuta, Katsuyo, 4,144,860, Cl. 123-148.00C.

ARCES S.r.l.: *See—*
Ceriani, Enrico, 4,145,067, Cl. 280-276.000.

Arch, David I.: *See—*
Smith, Fergus S.; and Arch, David I., 4,145,000, Cl. 239-14.000.

Argus Chemical Corporation: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, 4,145,333, Cl. 260-45.80N.

Arlt, Dieter: *See—*
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,145,512, Cl. 528-73.000.

Armasow, Waldemar; and Lindenthal, Hans, to Voith Transmit GmbH. Universal joint. 4,144,724, Cl. 64-17.00A.

Armstrong Cork Company: *See—*
Adams, Bruce E.; Hensel, Robert D.; and Quinn, Edwin J., 4,145,479, Cl. 428-500.000.

Armstrong, David G.; Bickford, William J.; VanderKruik, Ronald K.; and Zimmer, John T., to Raytheon Company. Radar performance monitor. 4,145,692, Cl. 343-17.700.

Arnold, Dan M.: *See—*
Pitts, Robert W., Jr.; and Arnold, Dan M., 4,144,754, Cl. 73-205.00D.

Arnold, Hamilton W., to Bell Telephone Laboratories, Incorporated. Digital satellite system and method for serving users of differing capacities. 4,145,573, Cl. 179-15.0BS.

Arnoldi, Wilhelm: *See—*
Mucha, Horst; Arnoldi, Wilhelm; Fattler, Kurt; Overath, Albrecht; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; and Audi, Josef, 4,145,723, Cl. 360-79.000.

Arnston, Robert W.: *See—*
Trussell, Gerald C.; Arnston, Robert W.; and Elyashar, Daniel, 4,145,746, Cl. 364-551.000.

Aron, Jerome, to Kuhn, S.A. Haymaking machine for tedding and windrowing of fodder. 4,144,699, Cl. 56-370.000.

Aroshidze, Jury V.; Iogansen, Vadim I.; Kadi-ogly, Ibragim A.; Petrov, Jury V.; Ptakul, Izrail A.; Romanov, Vasily V.; Sudarikov, Vasily L.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; and Shkoda, Gennady V. Elastic mounting of a core in an electric machine stator. 4,145,626, Cl. 310-91.000.

Arp Instruments, Inc.: *See—*
Suchoff, Michael A., 4,144,790, Cl. 84-1.240.

Arrighetti, Sergio; Brancaccio, Aldo; Cesca, Sebastiano; and Giuliani, Giampaolo, to Anic S.p.A. Method for the preparation of novel thermoplastic materials, and products obtained thereby. 4,145,378, Cl. 260-876.00R.

Arrow-Acme Corporation: *See—*
Borgen, Arden L., 4,144,981, Cl. 414-607.000.

Art Products, Inc.: *See—*
Lamb, Terrence R., 4,144,660, Cl. 38-102.500.

Arthur G. McKee & Company: *See—*
Czako, Charles A.; Berzins, Andrejs; and Greaves, Melvin J., 4,145,211, Cl. 75-34.000.

Asahi Glass Company Ltd.: *See—*
Hayashi, Takao; and Kawakami, Shoichi, 4,145,382, Cl. 260-987.000.
Nakata, Jyoichi; Chiba, Yasumasa; Seto, Tetsuhiko; and Fukuhara, Yoshinori, 4,145,265, Cl. 204-98.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Mizoguchi, Takahisa; Henmi, Hiroshi; Shima, Tsukasa; Yamashita, Yasuhiko; Uematsu, Shinichi; and Kawamura, Kazuo, 4,145,468, Cl. 428-239.000.

Asaka, Urataro; and Ohara, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Auxiliary intake passage for internal combustion engines. 4,144,850, Cl. 123-52.00M.

Aschwanden, Felix, to RCA Corporation. SECAM modulator. 4,145,711, Cl. 358-14.000.

ASEA Aktiebolag: *See—*
Stenkvist, Sven-Einar, 4,145,562, Cl. 13-1.000.

Aske, Vernon H., to Honeywell Inc. Linear accelerometer with torsion hinge suspension. 4,144,765, Cl. 73-517.00B.

Asselman, George A. A.; and Castelijns, Adrianus P. J., to U.S. Philips Corporation. Heat exchanger. 4,144,933, Cl. 165-124.000.

Atlantic Richfield Company: *See—*
Doan, Robert B., 4,145,302, Cl. 252-91.000.

Attwood, Brian W.: *See—*
White, Derek G. W.; Holloway, Nicholas H.; and Attwood, Brian W., 4,144,619, Cl. 19-304.000.

Auchinleck, Richard J.; Schisselbauer, John C.; Garczynski, John S.; Jablanofsky, Charles C.; and Dobson, Charles J., to Peripheral Dynamics, Inc. One-at-a-time card reader. 4,145,606, Cl. 235-477.000.

Audi, Josef: *See—*
Mucha, Horst; Arnoldi, Wilhelm; Fattler, Kurt; Overath, Albrecht; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; and Audi, Josef, 4,145,723, Cl. 360-79.000.

Auerbach, Albert A., to Medalert Corporation. Cardiac pacer and monitor system. 4,144,892, Cl. 128-419.0PT.

Austin, Lowell W.: *See—*
Bird, Richard A.; and Austin, Lowell W., 4,145,267, Cl. 204-140.000.

Automobiles Peugeot: *See—*
Mauboussin, Joel, 4,144,757, Cl. 73-308.000.

Avery, Peter J., to Aluma Building Systems Incorporated. Concrete forming structures. 4,144,690, Cl. 52-376.000.

Awaji, Toshio: *See—*
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.

Awazawa, Shigeru: *See—*
Nagano, Mineo; Awazawa, Shigeru; and Niwa, Tatsuhiko, 4,145,499, Cl. 526-201.000.

Ayer, Donald E., to Upjohn Company, The. Pyran analogs of trans-4,5-didehydro-PGI compounds. 4,145,535, Cl. 542-426.000.

B&B Electrical Manufacturing Co. Inc.: *See—*
Royer, Joel H., 4,145,728, Cl. 361-23.000.

B. F. Goodrich Company, The: *See—*
Beatty, James R., 4,144,740, Cl. 73-8.000.
deVry, William E.; Drake, Ralph S.; and Morrissey, Richard T., 4,145,514, Cl. 528-75.000.
Gilles, Jack C., 4,145,511, Cl. 528-73.000.

B-H Instrument Company, Inc.: *See—*
Heckman, Harry W., 4,145,231, Cl. 134-9.000.

B. W. B. Controls, Inc.: *See—*
Bergeron, Ned A., 4,145,025, Cl. 251-63.000.

Baatrup, Johannes V., to Danfoss A/S. Gerotor machine with pressure balancing recesses in inner gear. 4,145,167, Cl. 418-61.00B.

Baba, Masanao, to Nippon Cable Systems Inc. Single lever control unit for engines. 4,144,956, Cl. 192-0.096.

Babcock, Richard V.; Pack, John L.; and Hundstad, Richard L., to Westinghouse Electric Corp. Cathode electrode configuration for gas laser system. 4,145,669, Cl. 331-94.5PE.

Babcock & Wilcox Company, The: *See*—
Cooper, Adrianus A. G., 4,145,612, Cl. 250-439.00R.
Wehrmeister, Allen E., 4,144,766, Cl. 73-587.000.
Babin, Paul A. Hurricane/tornado building protection system. 4,144,802, Cl. 98-119.000.
Bacher, Helmuth, to Krauss-Maffei Austria Ges.m.b.H. Plant for transforming synthetic thermoplastic waste into an agglomerate. 4,145,172, Cl. 425-222.000.
Bacskai, Robert, to Chevron Research Company. Catalyst for the polymerization of 2-pyrrolidone from alkali metal. 4,145,519, Cl. 528-312.000.
Bader, Hartmann. Flat hollow section member for a textile machine. 4,144,910, Cl. 139-91.000.
Bagby, John P.; Hapke, Kenyon A.; and Wells, Thomas R., to Polaroid Corporation. Film cassette sensing and retaining unit. 4,145,126, Cl. 352-74.000.
Bahder, George; Eager, George S., Jr.; and Katz, Carlos, to General Cable Corporation. Solid dielectric cable resistant to electrochemical trees. 4,145,567, Cl. 174-107.000.
Bains, Gurdip S., to Westinghouse Electric Corp. Joint for interconnecting panels. 4,144,689, Cl. 52-285.000.
Baker, Ralph, II. Modular dismantleable fence. 4,145,031, Cl. 256-65.000.
Bakes, Michel: *See*—
Demarcq, Michel; Bakes, Michel; and Daude-Lagrave, Marie-Christine, 4,145,305, Cl. 252-186.000.
Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG: *See*—
Lange, Karl H., 4,145,128, Cl. 354-21.000.
Baldwin, John J., to Merck & Co., Inc. Substituted (3-loweralkylamino-2-$R_1$0-propoxy)pyridines, their preparation and use. 4,145,425, Cl. 424-263.000.
Balibrea, Gabriel K. Gun caddy. 4,144,971, Cl. 211-64.000.
Ballard, F. Leon: *See*—
Weishaar, Michael F.; and Ballard, F. Leon, 4,145,281, Cl. 210-37.00B.
Ballast-Nedam Groep N.V.: *See*—
Middelbeek, Cornelis G.; Polano, Machiel E.; and Wolters, Tjako A., 4,145,280, Cl. 210-20.000.
Ballinger, Dale O., to Honeywell Inc. Graphic recording apparatus with stylus addressing by shift registers. 4,145,697, Cl. 346-35.000.
Bannigan, John: *See*—
Bruno, Richard; Hermann, Wilhelm; Horster, Horst; Kersten, Reinhard; Klinkenberg, Klaus; Mahdjuri, Faramarz; and Bannigan, John, 4,144,875, Cl. 126-271.000.
Barbee, Gail G., to Caterpillar Tractor Co. Windshield wiper drive system. 4,144,614, Cl. 15-250.340.
Barch, Herbert W.: *See*—
Grodin, Martin A.; Barch, Herbert W.; Harvey, Frank E.; and Chardello, Patrick C., 4,145,202, Cl. 65-2.000.
Bargain, Michel; and Lefort, Marcel, to Rhone-Poulenc Industries. Polysiloxane thermoplastic elastomers. 4,145,508, Cl. 528-31.000.
Barics, Jozsef: *See*—
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Turk, Herbert; and Schiminski, Herbert, 4,145,010, Cl. 242-18.00A.
Barnett, Edward R., to Beach Manufacturing Corporation. Form roller compensator. 4,144,811, Cl. 101-349.000.
Baron, Arthur L.; and Sivaramakrishnan, Parameswar, to Mobay Chemical Corporation. Stress crack resistant polycarbonates. 4,145,373, Cl. 260-873.000.
Barr, Derek J., to Barr & Murphy Limited. Drying apparatus. 4,144,654, Cl. 34-33.000.
Barr & Murphy Limited: *See*—
Barr, Derek J., 4,144,654, Cl. 34-33.000.
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, to Rhone-Poulenc Industries. Pyrimidinyl-1,2-dithiole compounds and anti-bilharzia compositions thereof. 4,145,423, Cl. 424-251.000.
Bartling, Leonard C., Sr. Incinerating and energy converting apparatus. 4,144,824, Cl. 110-214.000.
BASF Aktiengesellschaft: *See*—
Dehnert, Johannes; and Dunkelmann, Guenter, 4,145,341, Cl. 260-154.000.
Graser, Fritz, 4,145,356, Cl. 260-360.000.
Krapf, Heinz; Oppenlaender, Knut; and Seib, Karl, 4,145,307, Cl. 252-309.000.
Sterzel, Hans-Josef; Schlichting, Karl; and Seydl, Wolfgang, 4,145,331, Cl. 260-40.00R.
Thoma, Peter; Habermann, Wolfgang; and Kranz, Joachim, 4,145,264, Cl. 204-59.00R.
Wetzler, Matthias; and Dockner, Toni, 4,145,553, Cl. 548-338.000.
BASF Wyandotte Corporation: *See*—
Newkirk, David D.; and Login, Robert B., 4,145,469, Cl. 428-245.000.
Basil, Samuel C. Concentric basketlike target game. 4,145,048, Cl. 273-95.00R.
Bassler, Edmund: *See*—
von Plessen, Helmold; and Bassler, Edmund, 4,145,393, Cl. 422-7.000.
Bastgen, Wendel, to Alb. Klein KG. Device for dewatering sludge. 4,144,807, Cl. 100-118.000.
Batchelor, John F.: *See*—
Hodson, Harold F.; and Batchelor, John F., 4,145,350, Cl. 260-308.00D.
Bates, Harry. System and method for shaping pulses of optical radiation. 4,145,607, Cl. 250-199.000.
Batrow Laboratories, Inc.: *See*—
Hickey, William, 4,144,893, Cl. 128-423.00R.
Battelle-Institut e.V.: *See*—
Schlueter, Gert; and Schuster, Wilheim, 4,144,760, Cl. 73-425.000.
Battigelli, Jean A.: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,145,203, Cl. 65-16.000.
Bauer, Werner R., to Robertshaw Controls Company. Reversing valve construction and method of making the same. 4,144,905, Cl. 137-625.660.
Baxter Travenol Laboratories, Inc.: *See*—
Parsons, George H., Jr.; and Eller, Thomas, 4,145,407, Cl. 424-1.000.
Bayer Aktiengesellschaft: *See*—
Feltgen, Karlheinz; Kaluza, Hans J.; Muschelknautz, Edgar; and Simon, Hans J., 4,145,520, Cl. 528-323.000.
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,145,428, Cl. 424-269.000.
Neukam, Theo; Druschke, Frank; Bentz, Francis; and Nischk, Gunther, 4,145,500, Cl. 526-204.000.
Psaar, Hubertus; and Raue, Roderich, 4,145,537, Cl. 542-465.000.
Schenk, Norbert; Losacker, Paul; and Martin, Manfred, 4,145,353, Cl. 260-346.700.
Schulze, Andreas; Sasse, Klaus; Naumann, Klaus; Roessler, Peter; and Kraus, Peter, 4,145,439, Cl. 424-285.000.
Sylvester, Gerd; Witte, Josef; and Marwede, Gunter, 4,145,497, Cl. 526-164.000.
Trautner, Kersten; and Schundehutte, Karl H., 4,145,342, Cl. 260-207.000.
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,145,512, Cl. 528-73.000.
Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans J., 4,145,507, Cl. 528-25.000.
Bayerische Motoren Werke Aktiengesellschaft: *See*—
Matschinsky, Wolfgang, 4,145,072, Cl. 280-668.000.
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Barnett, Edward R., 4,144,811, Cl. 101-349.000.
Sara, George M., 4,145,135, Cl. 354-317.000.
Beard, James D.; and Beck, Gene F., to Stephens Industries, Inc. Envelope edge slitting apparatus. 4,144,786, Cl. 83-732.000.
Beatty, James R., to B. F. Goodrich Company, The. Testing apparatus and method for measuring cutting, chipping and abrasion resistance. 4,144,740, Cl. 73-8.000.
Beauchamp, Gerson E., to DeSoto, Inc. Calcium oxide or hydroxide to improve the charge acceptance of electrographic dielectric resins. 4,145,478, Cl. 428-481.000.
Beaudouin, Pierre L.; and Debord, Pierre, to International Business Machines Corporation. Photosensitive self scan array with noise reduction. 4,145,721, Cl. 358-213.000.
Bebbington, Anthony J., to Commercial Organics Limited. Process for the production of saccharine. 4,145,349, Cl. 260-301.000.
Beck, Gene F.: *See*—
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Becker, Klaus; Lichtenvort, Uwe; and Behrmann, Dieter, to DEMAG Aktiengesellschaft. Slide. 4,145,042, Cl. 272-56.50R.
Becuwe, Alain G.; and Ucciani, Claude M., to Societe Nationale des Poudres et Explosifs. 2-Fluoro-2,2-dinitroethyl/substituted aryl carbonates and process for their preparation. 4,145,361, Cl. 260-463.000.
Beecham Group Limited: *See*—
Clarke, Christopher D., 4,145,429, Cl. 424-271.000.
Hunt, Eric, 4,145,430, Cl. 424-272.000.
Beemsterboer, George L.; and Satanek, Joseph, Jr., to Research Corporation. Chromatographic purification of maytansine. 4,145,345, Cl. 260-239.30T.
Behme, Klaus J.; Cherdron, Harald; Gordon, Wolfgang; and Burkhardt, Hugo, to Hoechst Aktiengesellschaft. Polyurethane foams containing reactive fibers and process for their manufacture. 4,145,487, Cl. 521-117.000.
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Beise, Hans; Schlicht, Burkhard; Thiele, Manfred; Gross, Manfred; Minak, Hans-Peter; Schingnitz, Manfred; Wehner, Klaus; and Burk, Werner. Method of processing technical gases. 4,145,192, Cl. 55-32.000.
Belanger, Patrice C., to Merck Sharp & Dohme (I.A.) Corp. 2-(4-Substituted-1,2,5-thiadiazole-3-yloxy)-acetaldehydes. 4,145,550, Cl. 544-367.000.
Bell & Howell Company: *See*—
Stodolski, Thomas R., 4,145,684, Cl. 340-311.000.
Bell Telephone Laboratories, Incorporated: *See*—
Acampora, Anthony; Reudink, Douglas O. J.; and Yeh, Yu S., 4,145,658, Cl. 325-180.000.
Angner, Ronald J.; Egan, Wayne J.; Gordon, Alan M.; and Huryn, William A., 4,145,579, Cl. 179-81.00R.
Arnold, Hamilton W., 4,145,573, Cl. 179-15.0BS.
Chang, Chuan C.; Chang, Robert P. H.; Coleman, James J.; and Sheng, Tan T., 4,144,634, Cl. 29-571.000.

Gans, Michael J., 4,145,695, Cl. 343-779.000.
Hu, Evelyn L.; and Jackel, Lawrence D., 4,145,699, Cl. 357-5.000.
Messerschmitt, David G., 4,145,667, Cl. 331-16.000.
Orriss, Richard A., 4,145,578, Cl. 179-27.00D.

Bendig, Lothar; and Klotz, Arthur, to Filterwerk Mann & Hummel GmbH. Device for automatically controlling the intake air temperature of a carburetor-equipped internal combustion engine. 4,144,857, Cl. 123-122.00D.

Bendix Corporation, The: *See*—
Datwyler, Walter F., Jr., 4,144,747, Cl. 73-141.00R.

Bendler, Hellmut, to Dynamit Nobel Aktiengesellschaft. Rotary power element. 4,144,714, Cl. 60-632.000.

Bendorf, Dwaine L., to Essex Group, Inc. Ignition system for fuel burning apparatus. 4,145,180, Cl. 431-46.000.

Benoit-Gonin, Roger; Berger, Jean L.; and Fontanes, Sylvain, to Thomson-CSF. Input stage for a CTD low-pass filter. 4,145,676, Cl. 333-165.000.

Bentz, Francis: *See*—
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Bereskin, Fred P.; and Borowczyk, Joseph J. Automatic system for trapping and removing waste hydrocarbons from water. 4,145,286, Cl. 210-104.000.

Berge, Sven E.; and Hultgren, K. Sten R., to AB Bofors. Device for a turret applied to a tank. 4,144,797, Cl. 89-41.00M.

Berger, Jean L.: *See*—
Benoit-Gonin, Roger; Berger, Jean L.; and Fontanes, Sylvain, 4,145,676, Cl. 333-165.000.

Bergeron, Ned A., to B. W. B. Controls, Inc. Control device. 4,145,025, Cl. 251-63.000.

Bergman, Carl P., to Bridgeport Chemical Corporation. Twist top actuated dispenser with follower. 4,144,988, Cl. 222-390.000.

Berlied, Henry P., Jr., to Doure Ski Binding Company. Ski binding. 4,145,070, Cl. 280-615.000.

Berlinger, Bernard E., Jr., to Westran Corporation. Actuator device. 4,144,774, Cl. 74-435.000.

Bernath, Oskar, to Georg Fischer AG Brugg. Apparatus for the vacuum impregnation of boards or panels of porous material. 4,144,836, Cl. 118-7.000.

Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., to Aktiebolaget Hassle. Phenoxy-hydroxypropylamines, their preparation, and method and pharmaceutical preparations for treating cardiovascular diseases. 4,145,442, Cl. 424-330.000.

Bertling, Johannes-Gerhard; and Schiele, Werner, to Robert Bosch GmbH. Fuel supply apparatus for an internal combustion engine. 4,144,858, Cl. 123-139.0AW.

Bertrand, Jean N. M.: *See*—
Bracke, William J. I.; Bertrand, Jean N. M.; and Zegers, Jacques T. L., 4,145,376, Cl. 260-876.00B.

Berzins, Andrejs: *See*—
Czako, Charles A.; Berzins, Andrejs; and Greaves, Melvin J., 4,145,211, Cl. 75-34.000.

Betensky, Ellis I., to Vivitar Corporation. Zoom lens. 4,145,115, Cl. 350-184.000.

Betz, Carl R.: *See*—
Drexler, Jerome; and Betz, Carl R., 4,145,758, Cl. 365-200.000.

Beuchat, Roger, to Mefina S.A. Missile security mechanism. 4,144,816, Cl. 102-251.000.

Bhatia, Yog R., to Dana Corporation. Polyacrylated polyurethanes and gaskets having sealants thereof. 4,145,509, Cl. 528-50.000.

Bickford, William J.: *See*—
Armstrong, David G.; Bickford, William J.; VanderKruik, Ronald K.; and Zimmer, John T., 4,145,692, Cl. 343-17.700.

Bienvenu, Jacques M. J., to Compagnie Honeywell Bull (Societe Anonyme). Method and apparatus for implementing the test of computer functional units. 4,145,734, Cl. 364-200.000.

Bio-Molecular Dynamics: *See*—
Cook, Melvin W., 4,145,293, Cl. 210-321.00A.

Bione, Angelo A.; Schnert, Robert J.; and Taylor, Horace E., to Marmon Company. Bass note generation system. 4,144,788, Cl. 84-1.010.

Bird, Richard A.; and Austin, Lowell W., to National Steel Corporation. Nonplating cathode and method for producing same. 4,145,267, Cl. 204-140.000.

Birk, Albert: *See*—
Maucher, Paul; and Birk, Albert, 4,144,959, Cl. 192-106.200.

Blackburn, Tom L.: *See*—
Wisotzky, Otto G.; and Blackburn, Tom L., 4,145,665, Cl. 330-254.000.

Blackwell, Jennings P., to Phillips Petroleum Company. Corrosion-inhibiting poly(arylene sulfide) coating compositions. 4,145,326, Cl. 260-29.60F.

Blanchard, Richard A.; and Choy, Benedict C. K., to Supertex, Inc. High power MOS device and fabrication method therefor. 4,145,703, Cl. 357-55.000.

Blanton, C. Kenneth. Apparatus for refracting, concentrating and collecting solar radiation. 4,144,873, Cl. 126-271.000.

Bliss, George D.; Kercso, Joseph E.; and McGuire, Richard J., to Syntex (U.S.A.) Inc. Aeration and filtration apparatus. 4,144,841, Cl. 119-5.000.

Bloom Engineering Company, Inc.: *See*—
Leumann, Hans E., 4,145,259, Cl. 202-248.000.

Boatman, Robert L.: *See*—
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Bock, Jan: *See*—
Lundberg, Robert D.; Makowski, Henry S.; and Bock, Jan, 4,145,379, Cl. 260-879.000.

Bock, Mark G.: *See*—
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Bock, Mark G., 4,145,551, Cl. 544-407.000.

Bode, Harald E. W. Multiphase signal oscillator. 4,145,670, Cl. 331-135.000.

Bodor, Nicholas S., to Interx Research Corporation. Sympathomimetic amines exhibiting anti-hemorrhoidal activity. 4,145,441, Cl. 424-309.000.

Bodson, Fernand J. J., to Societe des Mines et Fonderies de Zinc de la Vieille Montagne. Process for recovering silver and optionally gold from a solid starting material containing said metals. 4,145,212, Cl. 75-118.00R.

Boehringer Ingelheim GmbH: *See*—
Langbein, Adolf; Weber, Karl-Heinz; and Boke, Karin, 4,145,427, Cl. 424-267.000.

Boeing Company, The: *See*—
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Hogenhout, Franciscus, 4,144,625, Cl. 29-34.00B.

Boke, Karin: *See*—
Langbein, Adolf; Weber, Karl-Heinz; and Boke, Karin, 4,145,427, Cl. 424-267.000.

Bolen, Charles E.: *See*—
Roberts, Michael G.; and Bolen, Charles E., 4,145,381, Cl. 260-880.00R.

Bonnemay, Maurice; Broncel, Guy; Maximovitch nee Fabre, Suzanne; and Sarradin, Joel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Accumulators including halogen electrodes operating with fused halide based electrolytes. 4,145,483, Cl. 429-103.000.

Bonnie, G. Patrick, to Control Data Corporation. Fault tolerant bubble memory with redundancy using a stationary register on a single chip. 4,145,757, Cl. 365-17.000.

Boozalis, Theodore S.; and Ivy, John B., to Dow Chemical Company, The. Process for purifying 1,2-dichloroethane. 4,145,367, Cl. 260-652.00P.

Borg-Warner Corporation: *See*—
Fogelberg, Mark J.; and Roberts, Richard W., 4,145,163, Cl. 417-222.000.
Narducy, Kenneth W.; Falk, John C.; and Cohen, Murray S., 4,145,374, Cl. 260-873.000.
Wozny, Mary E., 4,145,489, Cl. 526-1.000.

Borgen, Arden L., to Arrow-Acme Corporation. Portable ladle for use with a forklift truck. 4,144,981, Cl. 414-607.000.

Born, Manfred: *See*—
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Boroda, Valentin I.: *See*—
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Borowczyk, Joseph J.: *See*—
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Bostwick, Joseph H., to Du Pont de Nemours, E. I., and Company. Method for the oxidative treatment of textiles with activated peroxygen compounds. 4,145,183, Cl. 8-111.000.

Bottasso, Franco; and Colombani, Bruno, to Industrie Pirelli S.p.A. Process and apparatus for turning-up the sidewalls and body plies of fabric for torus-shaped vehicle tire. 4,145,238, Cl. 156-132.000.

Boujet, Jean-Pierre, to Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel. Multiplexer for millimetric waves. 4,145,673, Cl. 333-135.000.

Bourdeau, Charles: *See*—
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Bowen, Mack D., to Georgia Tech Research Institute. Method and apparatus for producing a carbonaceous residue product. 4,145,256, Cl. 201-25.000.

Boynton, Rudy C.; and Witherspoon, Ronald A. Ski lock. 4,144,728, Cl. 70-58.000.

BP Chemicals Limited: *See*—
Matheson, Ian A., 4,145,312, Cl. 252-429.00B.

Bracke, William J. I.; Bertrand, Jean N. M.; and Zegers, Jacques T. L., to Labofina S. A. High impact polystyrene composition. 4,145,376, Cl. 260-876.00B.

Brackin, John F.; and Jendersee, Melvin H., to Toro Company, The. Belt idler construction. 4,144,772, Cl. 74-242.15R.

Brain, Devin K.; and Cummins, Marian T., to Procter & Gamble Company, The. Detergent composition containing encapsulated perfume. 4,145,184, Cl. 8-137.000.

Brancaccio, Aldo: *See*—
Arrighetti, Sergio; Brancaccio, Aldo; Cesca, Sebastiano; and Giuliani, Giampaolo, 4,145,378, Cl. 260-876.00R.

Brandes, Wilhelm: *See*—
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Brandstrom, Arne E.: *See*—
Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., 4,145,442, Cl. 424-330.000.

Braun, Erhard: *See*—
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Braunstein, Murray Jack: *See—*
Henderson, William D., deceased, 4,144,915, Cl. 141-18.000.
Brepoels, Joseph R.; and Vaneghem, Jean-Marie, to S.A. P R B en Neerlandais PRB N.V. Process for the arylation of olefines. 4,145,362, Cl. 260-465.00G.
Brian, Michael: *See—*
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Brickeen, Robert W., Sr., to Container Corporation of America. Closure structure for containers. 4,144,994, Cl. 229-5.600.
Bridgeport Chemical Corporation: *See—*
Bergman, Carl P., 4,144,988, Cl. 222-390.000.
Bridges, Jack; and Taflove, Allen, to IIT Research Institute. Apparatus and method for in situ heat processing of hydrocarbonaceous formations. 4,144,935, Cl. 166-248.000.
Bridgestone Cycle Co. Ltd.: *See—*
Toyomasu, Takeshi; Furusawa, Michito; Mabuchi, Sadao; and Gushima, Mitsuo, 4,145,068, Cl. 280-281.00R.
Bridgestone Tire Company Limited: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Taniguchi, Yoshiko; Saito, Masumi; and Sakata, Ryozo, 4,145,318, Cl. 521-112.000.
Brimo, Joseph. Safety device. 4,145,027, Cl. 254-156.000.
Brinkhous, Kenneth M.; and Read, Marjorie S., to Research Triangle Institute. Reagents for screening tests and bioassay of von Willebrand's factor (platelet aggregating factor) in blood plasmas. 4,145,185, Cl. 23-230.00B.
British Columbia Research Council: *See—*
Oehr, Klaus H., 4,145,268, Cl. 204-149.000.
British Industrial Plastics, Ltd.: *See—*
Murray, Christopher L.; and Vale, Corwyn P., 4,145,372, Cl. 260-857.0PE.
Sreeves, John E., 4,145,370, Cl. 260-835.000.
Britton, Fred G.; Richardson, Murl R.; and von Bose, Robert J., to Oil States Rubber Co. Diaphragm closure support system. 4,145,158, Cl. 405-208.000.
Brizendine, Wesley D.: *See—*
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Bromer, Gunter; and Kanzler, Wolfgang, to Siemens Aktiengesellschaft. Means for controlling the feed rate of a work piece in a numerically controlled nibbling machine. 4,144,780, Cl. 83-71.000.
Bronoel, Guy: *See—*
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Brookhart, Marshall R., to Minnesota Mining and Manufacturing Company. Single track audio-digital recorder and circuit for use therein having error correction. 4,145,683, Cl. 340-146.10F.
Broussard, Vernon K. Trash compactor for industrial use. 4,144,806, Cl. 100-100.000.
Brown, Anna P., to Brown, Anna P.; Brown, Joseph S.; and Brown, Richard A. R. J. Artist's paintbrush. 4,144,611, Cl. 15-192.000.
Brown, Jack, to Singer Company, The. Expanded entry for programmable memory of a sewing machine. 4,144,827, Cl. 112-158.00E.
Brown, Joseph S.: *See—*
Brown, Anna P., 4,144,611, Cl. 15-192.000.
Brown, Richard A. R. J.: *See—*
Brown, Anna P., 4,144,611, Cl. 15-192.000.
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. 4-Pyrimidone compounds. 4,145,546, Cl. 544-310.000.
Bruckenstein, Stanley, to Andco Industries, Inc. Process for purifying waste water containing fluoride ion. 4,145,282, Cl. 210-46.000.
Brun, Craig W.: *See—*
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Brunes, Tons J. Self-supporting girder structure. 4,144,687, Cl. 52-229.000.
Bruno, Richard; Hermann, Wilhelm; Horster, Horst; Kersten, Reinhard; Klinkenberg, Klaus; Mahdjuri, Faramarz; and Bannigan, John. Solar collector comprising an entrance window consisting of evacuated tubes. 4,144,875, Cl. 126-271.000.
Bruylants, Philippe M.; Fripiat, Jose J.; Rodrigue, Luc W.; Poncelet, Georges M.; and Munaut, Antonin A., to Unibra Societe Anonyme. Process for preparing magnetic oxides. 4,145,301, Cl. 252-62.560.
Bubien, James K. Raising pelagic game fish. 4,144,840, Cl. 119-3.000.
Bubnich, Frank J.; and Bubnich, Marketta A. Vehicle parking guide and electrical signaling device. 4,145,681, Cl. 340-51.000.
Bubnich, Marketta A.: *See—*
Bubnich, Frank J.; and Bubnich, Marketta A., 4,145,681, Cl. 340-51.000.
Buchel, Karl H.: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,145,428, Cl. 424-269.000.
Buchholz, Alexis, to Gillette Company, The. Hair clippers. 4,144,640, Cl. 30-221.000.
Bucholz, Lee M.: *See—*
Janssen, Robert L.; and Bucholz, Lee M., 4,145,052, Cl. 273-171.000.
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Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.
Budge, Daniel C.: *See—*
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Bueler, Richard C.; and McWilliams, Dennis M., to Wagner Electric Corporation. Dual relay control valve having integral solenoid valve. 4,145,091, Cl. 303-118.000.
Buildex, Inc.: *See—*
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Bunch, Laverne R., to CGR Medical Corporation. Motorized X-ray tube assembly. 4,145,613, Cl. 250-445.00T.
Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-alkylcarbonyl-9-deoxy-9,10-didehydro-PGD compounds. 4,145,365, Cl. 260-586.00R.
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-PFG$_1$-piperidylamides. 4,145,534, Cl. 542-426.000.
Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-9-deoxy-9-methylene-16-phenyl-PGF compounds. 4,145,561, Cl. 568-807.000.
Burk, Werner: *See—*
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Burkhardt, Paul J.; and Poponiak, Michael R., to International Business Machines Corporation. Method for manufacture of a moisture sensor. 4,144,636, Cl. 29-590.000.
Burns, Richard C.; and Johnson, Alexander L., to Du Pont de Nemours, E. I., and Company. Nitro aromatic glycosides. 4,145,527, Cl. 536-4.000.
Burroughs Corporation: *See—*
Doucette, Richard L., 4,145,623, Cl. 307-289.000.
Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., 4,145,702, Cl. 357-45.000.
Burroughs Wellcome Co.: *See—*
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Buschor, Josef J.: *See—*
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Bussink, Jan; and de Munck, Johannes W. J., to General Electric Company. Composition of a polyphenylene ether, a styrene resin, a precompounded polymer system and a block copolymer of a vinyl aromatic compound and an olefinic elastomer. 4,145,377, Cl. 260-876.00B.
Butler, Walter J.; and Puckette, Charles M., to General Electric Company. A/D Converter. 4,145,689, Cl. 340-347.0AD.
Butler, Walter J.: *See—*
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Buxbaum, Lothar; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Thermoplastic copolyesters based on poly-1,4-butylene terephthalate. 4,145,335, Cl. 528-302.000.
Buynak, Eugene B.; and Hilleman, Maurice R., to Merck & Co., Inc. Respiratory syncytial vaccine. 4,145,252, Cl. 195-1.300.
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Byrne, Robert: *See—*
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C. D. Sparling Company: *See—*
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C. Reichert Optische Werke, AG: *See—*
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Cacho, Mike M. Nut huller and/or sheller. 4,144,805, Cl. 99-568.000.
Cadawas, Thomas L. Loudspeaker enclosure with acoustically coupled loudspeaker damper. 4,145,571, Cl. 179-1.00E.
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Perkins, Gerald S.; and Moore, Nicholas R., 4,145,165, Cl. 417-418.000.
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Justice, Orien N., 4,145,166, Cl. 417-519.000.
Cameron, James F.: *See—*
Gregory, Charles E.; Brian, Michael; Thomas, Jerald F.; and Cameron, James F., 4,144,903, Cl. 137-624.110.
Campo, Edgar A.; and Lewis, Robert B., to Du Pont de Nemours, E. I., and Company. Material converger. 4,144,618, Cl. 19-161.100.
Canadian Patents and Development Limited: *See—*
Chow, Suezone, 4,145,242, Cl. 156-316.000.
Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinvasa, 4,145,295, Cl. 210-500.00M.
Wong, George S. K., 4,145,661, Cl. 328-145.000.
Cannon, Thomas G.: *See—*
Mackay, Frederick G.; Keryluk, Horace T.; and Cannon, Thomas G., 4,145,603, Cl. 219-387.000.
Canon Kabushiki Kaisha: *See—*
Date, Nobuaki, 4,145,011, Cl. 242-71.600.
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Murakami, Hiroyasu; and Ito, Tadashi, 4,145,129, Cl. 354-23.00D.
Sakurai, Masaaki; and Ishida, Masato, 4,145,599, Cl. 219-216.000.
Shimizu, Masami; Aizawa, Hiroshi; Yamamichi, Masayoshi; Iura, Yukio; Uchidoi, Masanori; and Tsunekawa, Tokuichi, 4,145,130, Cl. 354-51.000.
Takahashi, Toru, 4,145,136, Cl. 355-8.000.

Cantaluppi, Angelo: *See—*
Porta, Paolo D.; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 4,145,355, Cl. 260-348.340.

Capper, Joan M. Miniature wicker furniture and method of assembling same. 4,145,084, Cl. 297-418.000.

Careglio, Giuseppe: *See—*
Restori, Ettore; and Careglio, Giuseppe, 4,145,618, Cl. 307-64.000.

Carels, Mariette S. C.: *See—*
Shepherd, David; and Carels, Mariette S. C., 4,145,254, Cl. 195-81.000.

Carl Still, Firma: *See—*
Knappstein, Johannes; Stratmann, Josef; and Strobel, Manfred, 4,145,195, Cl. 55-242.000.

Carlow, Earl F.; Mathys, Wilbur L.; Mensch, William D.; Peddle, Charles; and Wiles, Michael F., to Motorola, Inc. Data direction register for interface adaptor chip. 4,145,751, Cl. 364-900.000.

Carlsson, Enar I.: *See—*
Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., 4,145,442, Cl. 424-330.000.

Carlsson, Richard, to AB Platslageriet Rostfri. Automatically controlled electric steam cooking pan. 4,145,604, Cl. 219-439.000.

Carlsson, Stig A. I.: *See—*
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Carlsson, Stig M., to Sunds AB. Method and apparatus for conveying sheets of corrugated cardboard or similar material through a processing machine. 4,145,039, Cl. 271-274.000.

Carn, Patrick. Sled-type vehicles. 4,145,064, Cl. 280-87.010.

Carpenter, Stephen K.: *See—*
Schick, Lloyd A.; and Carpenter, Stephen K., 4,145,406, Cl. 424-1.000.

Carrier Corporation: *See—*
Anderson, Carl M.; and Leonard, Louis H., 4,144,717, Cl. 62-117.000.
Wagaman, Neil D.; Meeks, Hatcher R.; and Alexander, Donald E., 4,145,384, Cl. 261-35.000.

Carrier Drysys Limited: *See—*
Johnston, Edward, 4,144,837, Cl. 118-7.000.

Cartes, Juan Bosch: *See—*
Jarque, Ricardo G.; Domingo, Mercedes A.; Cartes, Juan Bosch; Roldan, Cristobal M.; and Peinado, Fernando R., 4,145,424, Cl. 424-256.000.

Carty, Daniel T.: *See—*
Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., 4,145,380, Cl. 260-879.000.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,145,753, Cl. 364-900.000.

Castelijns, Adrianus P. J.: *See—*
Asselman, George A. A.; and Castelijns, Adrianus P. J., 4,144,933, Cl. 165-124.000.

Caterpillar Tractor Co.: *See—*
Barbee, Gail G., 4,144,614, Cl. 15-250.340.
McLuckie, Walter L.; and Williamson, Herschel M., 4,145,073, Cl. 280-702.000.

Caudel, Edward R.; and Wilson, William R., to Texas Instruments Incorporated. Digitally transmitting transceiver. 4,145,655, Cl. 325-15.000.

Caudel, Edward R.: *See—*
Merryman, Jerry D.; Cochran, Michael J.; and Caudel, Edward R., 4,145,656, Cl. 325-25.000.

Cavroy, Patrick G.: *See—*
Cousin, Charles M.; and Cavroy, Patrick G., 4,145,452, Cl. 426-321.000.

Celanese Corporation: *See—*
Kuzma, Edward J., 4,145,319, Cl. 260-22.0CB.

Ceriani, Enrico, to ARCES S.r.l. Suspension system for a motor vehicle. 4,145,067, Cl. 280-276.000.

Cesca, Sebastiano: *See—*
Arrighetti, Sergio; Brancaccio, Aldo; Cesca, Sebastiano; and Giuliani, Giampaolo, 4,145,378, Cl. 260-876.00R.

CGR Medical Corporation: *See—*
Bunch, Laverne R., 4,145,613, Cl. 250-445.00T.

Chang, Chuan C.; Chang, Robert P. H.; Coleman, James J.; and Sheng, Tan T., to Bell Telephone Laboratories, Incorporated. Fabrication of gallium arsenide MOS devices. 4,144,634, Cl. 29-571.000.

Chang, Robert P. H.: *See—*
Chang, Chuan C.; Chang, Robert P. H.; Coleman, James J.; and Sheng, Tan T., 4,144,634, Cl. 29-571.000.

Chapman, Melvin H. Filigreed belt and method of making same. 4,144,594, Cl. 2-338.000.

Chappell, Cluff E. Apparel worn for the aid and protection of the body and for the support and assistance of impaired joint function. 4,144,881, Cl. 128-80.00R.

Chardello, Patrick C.: *See—*
Grodin, Martin A.; Barch, Herbert W.; Harvey, Frank E.; and Chardello, Patrick C., 4,145,202, Cl. 65-2.000.

Chatard, Michel; Pignard, Guy; and Thiery, Jean, to Institut Francais du Petrole. Method and device for automatically positioning a flexible elongate member in a storage basket rotatable about a vertical axis. 4,145,014, Cl. 242-83.000.

Chen, Albert C., to Mobil Oil Corporation. Coatings based on hydrolyzed epoxy resins. 4,145,324, Cl. 260-29.40R.

Cherdron, Harald: *See—*
Behme, Klaus J.; Cherdron, Harald; Gordon, Wolfgang; and Burkhardt, Hugo, 4,145,487, Cl. 521-117.000.

Chernyavsky, Vladimir P.: *See—*
Aroshidze, Jury V.; Iogansen, Vadim I.; Kadi-ogly, Ibragim A.; Petrov, Jury V.; Ptakul, Izrail A.; Romanov, Vasily V.; Sudarikov, Vasily L.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; and Shkoda, Gennady V., 4,145,626, Cl. 310-91.000.

Chervyakova, Ljudmila D.: *See—*
Podkopaev, Boris I.; Klunko, Ivan F.; Kiry, Grigory S.; Ocheretko, Vyacheslav V.; Rozhdestvensky, Lev I.; and Chervyakova, Ljudmila D., 4,144,656, Cl. 35-9.00A.

Chevron Research Company: *See—*
Bacskai, Robert, 4,145,519, Cl. 528-312.000.
Miller, Stephen J., 4,145,277, Cl. 208-212.000.

Chiba, Yasumasa: *See—*
Nakata, Jyoichi; Chiba, Yasumasa; Seto, Tetsuhiko; and Fukuhara, Yoshinori, 4,145,265, Cl. 204-98.000.

Chika, Hani. Eyeglass lens with indicia and method of making same. 4,145,125, Cl. 351-165.000.

Chin, Jack: *See—*
Ohkawa, Tihiro; and Chin, Jack, 4,145,250, Cl. 176-3.000.

Chloride Batteries Australia Limited: *See—*
Emerton, Barry G.; Weir, William A.; and McLean, Thomas F., 4,144,927, Cl. 164-108.000.

Chow, Suezone, to Canadian Patents and Development Limited. Wood treatment for preserving bondability. 4,145,242, Cl. 156-316.000.

Choy, Benedict C. K.: *See—*
Blanchard, Richard A.; and Choy, Benedict C. K., 4,145,703, Cl. 357-55.000.

Christie Electric Corp.: *See—*
Eddy, Richard P., 4,144,991, Cl. 226-195.000.

Chromie, Edsel. Solar powered engine and tracking system. 4,144,716, Cl. 60-641.000.

Chronister, Clyde H. Valve with self-actuating fluid seal. 4,145,026, Cl. 251-80.000.

Chuang, Jui-Chang; and Trucker, Donald E., to GAF Corporation. Synthetic polymer latices in photographic silver halide emulsions containing multivalent metal salts. 4,145,221, Cl. 96-95.000.

Chugai Syiyaku Kabushiki Kaisha: *See—*
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,145,357, Cl. 260-397.200.

Ciba-Geigy AG: *See—*
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,145,217, Cl. 96-53.000.

Ciba-Geigy Corporation: *See—*
Buxbaum, Lothar; and Habermeier, Jurgen, 4,145,335, Cl. 528-302.000.
Eldin, Sameer H.; Seiz, Wolfgang; and Forster, Ewald, 4,145,247, Cl. 162-136.000.
Hall, Luther A. R.; and Gordon, David A., 4,145,510, Cl. 528-72.000.
Muller, Beat; Kump, Wilhelm; and Wacker, Oskar, 4,145,344, Cl. 260-239.30B.

Cities Service Company: *See—*
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,145,309, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,145,310, Cl. 252-358.000.

Citizen Watch Co. Ltd.: *See—*
Iinuma, Yoshio, 4,144,705, Cl. 58-52.00R.
Ohkawara, Yasuo; Mizutani, Nagao; Kurihara, Toshio; and Nojima, Masamitsu, 4,145,146, Cl. 400-614.000.

Clairol Incorporated: *See—*
Walter, Henry J.; and Kunz, Raymond W., 4,145,600, Cl. 219-222.000.

Clark Equipment Company: *See—*
Estkowski, Michael H., 4,144,862, Cl. 123-196.00S.

Clark, Raymond; and Neill, William T., Jr., to Applied Power Inc. Patient lifting device. 4,144,713, Cl. 60-477.000.

Clarke, Christopher D., to Beecham Group Limited. Oral veterinary preparations. 4,145,429, Cl. 424-271.000.

Clever, Eric C., to Electronic Management Support, Inc. Surveillance system. 4,145,715, Cl. 358-108.000.

Coates, David; Gray, George W.; and McDonnell, Damien G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Pleochroic dyes. 4,145,114, Cl. 350-349.000.

Cochran, Michael J.; and Hamilton, Stephen P., to Texas Instruments Incorporated. Thermal line printer. 4,145,756, Cl. 364-900.000.

Cochran, Michael J.: *See—*
Merryman, Jerry D.; Cochran, Michael J.; and Caudel, Edward R., 4,145,656, Cl. 325-25.000.

Cohen, Murray S.: *See—*
Narducy, Kenneth W.; Falk, John C.; and Cohen, Murray S., 4,145,374, Cl. 260-873.000.

Colaco, Stephen F., to Ferranti Limited. Transistor logic circuits. 4,145,621, Cl. 307-215.000.

Cole, Robert, to Albright & Wilson Limited. Flameproofing of textiles. 4,145,463, Cl. 427-337.000.

Coleman, James J.: *See—*
Chang, Chuan C.; Chang, Robert P. H.; Coleman, James J.; and Sheng, Tan T., 4,144,634, Cl. 29-571.000.

Colgate-Palmolive Company: *See—*
Mende, William C., 4,145,411, Cl. 424-45.000.
Pocklington, Terence W., 4,145,045, Cl. 273-61.00C.

Collins, Donald O.: *See—*
Silverman, Allen B.; and Collins, Donald O., 4,144,794, Cl. 84-327.000.
Colombani, Bruno: *See—*
Bottasso, Franco; and Colombani, Bruno, 4,145,238, Cl. 156-132.000.
Colorado Seminary: *See—*
Rinard, George A.; Rugg, Donald E.; and Steffen, Dale A., 4,145,122, Cl. 351-7.000.
Colorguard Corporation: *See—*
Ingraham, Glen E., 4,145,030, Cl. 256-1.000.
Colour Video Services: *See—*
Venis, Ronald J., 4,145,710, Cl. 358-7.000.
Comfort, Edward C. Book holder. 4,145,022, Cl. 248-453.000.
Commercial Organics Limited: *See—*
Bebbington, Anthony J., 4,145,349, Cl. 260-301.000.
Compagnie General d'Electricite S.A.: *See—*
Donon, Jerome, 4,145,565, Cl. 174-28.000.
Compagnie Honeywell Bull (Societe Anonyme): *See—*
Bienvenu, Jacques M. J., 4,145,734, Cl. 364-200.000.
Conaty, Francis X., to RCA Corporation. Video record package. 4,145,726, Cl. 360-133.000.
Conger, Robert P.: *See—*
Pogozelski, Vincent F.; and Conger, Robert P., 4,145,515, Cl. 528-77.000.
Congoleum Corporation: *See—*
Pogozelski, Vincent F.; and Conger, Robert P., 4,145,515, Cl. 528-77.000.
Console, Ortha M.; and Griffin, Alvah M., to Foremost-McKesson, Inc. Disinfecting means within a water dispenser. 4,145,291, Cl. 210-232.000.
Consolidated Electronic Industries Pty., Ltd.: *See—*
Medding, Reuben; and Kaye, Peter D., 4,145,724, Cl. 360-92.000.
Container Corporation of America: *See—*
Brickeen, Robert W., Sr., 4,144,994, Cl. 229-5.600.
Continental Oil Company: *See—*
Gorin, Everett, 4,145,405, Cl. 423-657.000.
Weimer, Dean R.; and Freshour, Kenneth D., 4,145,496, Cl. 526-62.000.
Contraves AG: *See—*
Stait, Donald P., 4,144,885, Cl. 128-218.00P.
Control Data Corporation: *See—*
Bonnie, G. Patrick, 4,145,757, Cl. 365-17.000.
Conway, Charles S. Method and apparatus for venting hydrocarbon gases from the cargo compartments of a tanker vessel. 4,144,829, Cl. 114-74.00R.
Cook, George E.: *See—*
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,145,593, Cl. 219-60.00A.
Cook, John, to Pullman Incorporated. Semi-dump truck level indicator. 4,145,682, Cl. 340-52.00H.
Cook, Melvin W., to Bio-Molecular Dynamics. Precise cutoff concentrator-dialyzer device. 4,145,293, Cl. 210-321.00A.
Cooper, Adrianus A. G., to Babcock & Wilcox Company, The. X-ray patient support stretcher and method for fabrication. 4,145,612, Cl. 250-439.00R.
Corbin, Lawrence W., to Fort Wayne Wire Die, Inc. Wire drawing die and method of making the same. 4,144,739, Cl. 72-467.000.
Cordis Corporation: *See—*
Hess, Stanley R., 4,144,890, Cl. 128-418.000.
Cosyns, Jean; and Franck, Jean-Pierre, to Institut Francais du Petrole. Process for the 3-step catalytic treatment of highly unsaturated heavy fractions under hydrogen pressure. 4,145,276, Cl. 208-57.000.
Cotrel, Claude: *See—*
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,145,423, Cl. 424-251.000.
Cottam, Spencer D., to Midcon Pipeline Equipment Co. Pipe wrapping coating apparatus. 4,145,243, Cl. 156-392.000.
Cousin, Charles M.; and Cavroy, Patrick G. Fatty substances of quasi-vitreous structure. 4,145,452, Cl. 426-321.000.
Cousin, Gilbert. Topographic bench mark. 4,144,682, Cl. 52-103.000.
Coventry Climax Limited: *See—*
Drake, Ronald, 4,144,978, Cl. 414-544.000.
Covey, Leylan V. Portable transfer toy. 4,145,244, Cl. 156-541.000.
Coville, Michael W. C.: *See—*
Robinson, Peter M.; Coville, Michael W. C.; and Dexter, Robin W., 4,145,495, Cl. 526-93.000.
Covington, Morris T.; and Griffin, Steven M., to Shafer Valve Company. Electronic fluid pipeline leak detector and method. 4,144,743, Cl. 73-40.50R.
Covington, Wayne F.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,742, Cl. 364-709.000.
Olander, Emil E., Jr.; James, Rex J.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,752, Cl. 364-709.000.
Coxon, George E., to Thorn Electrical Industries Limited. Adhesives. 4,145,332, Cl. 260-42.520.
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Bock, Mark G., to Merck & Co., Inc. Pyrazine-2-carbonyloxyguanidines. 4,145,551, Cl. 544-407.000.
Cramwinckel, Hans: *See—*
De Bijl, Adrianus M. J.; and Cramwinckel, Hans, 4,145,745, Cl. 364-200.000.
Craven, Lawrence C.; and Sherosky, Frank. Shaving kit. 4,144,967, Cl. 206-229.000.
Crawley, Graham C.: *See—*
Aldridge, David C.; Crawley, Graham C.; and Strawson, Colin J., 4,145,437, Cl. 424-279.000.
Cremer, Helmut: *See—*
Knoche, Karl F.; Cremer, Helmut; and Steinborn, Gerhard, 4,145,402, Cl. 423-579.000.
Croce, Piero D.; Pellizzon, Tullio; Schwarz, Peter; and Piccolo, Luigi, to Euteco S.p.A. Process for the joint production of aromatic amines and iron oxide pigments. 4,145,228, Cl. 106-304.000.
Crone, Richard L.; and Elton, Robert L., to Minnesota Mining and Manufacturing Company. Low-profile raised retroreflective sheeting. 4,145,112, Cl. 350-103.000.
Crosby, John; and Milner, John A., to Imperial Chemical Industries Limited. Production of isocyanates. 4,145,360, Cl. 260-453.00P.
Crowe, William D., to J. R. Schneider Company. Filter apparatus. 4,145,288, Cl. 210-111.000.
Crown Zellerbach Corporation: *See—*
Goheen, David W.; and Fahey, Michael D., 4,145,246, Cl. 162-23.000.
Crumpacker, William H. Grazing regulator. 4,144,844, Cl. 119-133.000.
Cruthers, Larry R.: *See—*
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,145,431, Cl. 424-273.00B.
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,145,433, Cl. 424-273.00B.
Culbertson, George S.: *See—*
Petrille, Dennis G.; and Culbertson, George S., 4,145,493, Cl. 526-58.000.
Cumming, Allen R.; and Peterson, Clyde O., to Westinghouse Electric Corp. Remote settable fuze information link. 4,144,815, Cl. 102-214.000.
Cummins, Marian T.: *See—*
Brain, Devin K.; and Cummins, Marian T., 4,145,184, Cl. 8-137.000.
Curry, Kenneth D. Tire tread siping machine. 4,144,923, Cl. 157-13.000.
Cuschera, Casper. Pop up drain fitting. 4,144,599, Cl. 4-287.000.
Custom Cable Company: *See—*
Moore, Boyd B.; and Kendall, Clarence E., Jr., 4,144,610, Cl. 15-159.00A.
Cutter, Louis A.; and Nunn, Robert E., to United States Steel Corporation. Making styrene/maleic anhydride copolymers by suspension polymerization. 4,145,375, Cl. 260-874.000.
Cyphelly, Ivan J. Fluid pressure unit with hydrostatic torque transmission by roller pistons. 4,144,798, Cl. 91-488.000.
Czako, Charles A.; Berzins, Andrejs; and Greaves, Melvin J., to Arthur G. McKee & Company. Method for cooling reduced metal agglomerates. 4,145,211, Cl. 75-34.000.
Daenen, Bernardus, to Van Der Molen Machinefabriek B. V. Method and apparatus for joining strips cut from tobacco leaves together to form a ribbon. 4,144,896, Cl. 131-149.000.
Daenen, Theo E. G.; and Stolk, Steven A., to U.S. Philips Corporation. Electrolyte-liquid for the electrodeposition of aluminum. 4,145,261, Cl. 204-14.00N.
Dahl, Forrest N. Bird spook. 4,144,832, Cl. 116-22.00A.
Dahm, Wolfram, to Daimler-Benz Aktiengesellschaft. Liquid-cooled internal combustion engine. 4,144,849, Cl. 123-41.540.
Daikin Kogyo Co., Ltd.: *See—*
Sako, Junichi; Honda, Norimasa; Tokunaga, Hideo; Hoshino, Toshiro; and Kai, Shin-ichiro, 4,145,385, Cl. 264-22.000.
Daimler-Benz Aktiengesellschaft: *See—*
Abthoff, Jorg; and Schuster, Hans-Dieter, 4,145,394, Cl. 422-179.000.
Dahm, Wolfram, 4,144,849, Cl. 123-41.540.
Fritschi, Willi, 4,144,604, Cl. 5-360.000.
Gotz, Hans; Hack, Albert; and Winz, Hans, 4,144,803, Cl. 98-2.180.
Haberle, Fritz; Riechers, Daniel; and Hochrathner, Alfred, 4,145,077, Cl. 293-102.000.
Dairman, Wallace M.; Felix, Arthur M.; Gallo-Torres, Hugo E.; Heimer, Edgar P.; and Meienhofer, Johannes A., to Hoffmann-La Roche Inc. Aminoethylglycine containing polypeptides. 4,145,337, Cl. 260-112.50S.
Dake, Donald W. Fishing lure. 4,144,665, Cl. 43-42.350.
Daley, Earl W. Bowling pin cleaning apparatus. 4,144,608, Cl. 15-97.00R.
Dalferth, Hans; and Smetz, Reinhard. Eyed hook. 4,144,709, Cl. 59-93.000.
Dalibor, Horst, to Hoechst Aktiengesellschaft. Process for the manufacture of soluble copolymers which contain hydroxyl groups and can be crosslinked with organic polyisocyanates. 4,145,513, Cl. 528-75.000.
Daly, David M.; and Stone, Cynthia L., to Daly, David M. Cradle for controlling abnormal sitting postures. 4,145,082, Cl. 297-384.000.
Daly, William: *See—*
Gradwell, John; and Daly, William, 4,144,672, Cl. 47-73.000.
Dan, Ervin: *See—*
Guillet, James E.; and Dan, Ervin, 4,145,516, Cl. 528-85.000.
Dana Corporation: *See—*
Bhatia, Yog R., 4,145,509, Cl. 528-50.000.
Danfoss A/S: *See—*
Baatrup, Johannes V., 4,145,167, Cl. 418-61.00B.
Larsen, Poul M., 4,144,753, Cl. 73-194.00A.
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Nielsen, Kaj; and Nygaard, Nils H., 4,145,647, Cl. 318-810.000.
Termansen, Paul E., 4,144,712, Cl. 60-384.000.

Dang Vu, Quang: *See*—
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Daniels, E. Robert. Orthopedic table. 4,144,880, Cl. 128-71.000.

Danielsen, Per R.: *See*—
Saenger, Leif H.; and Danielsen, Per R., 4,144,663, Cl. 40-406.000.

Dardi, Louis E.: *See*—
Gupta, Dinesh K.; Dardi, Louis E.; and Freeman, William R., Jr., 4,145,481, Cl. 428-678.000.

Darncharnjitt, Kris. Insect trap. 4,144,668, Cl. 43-107.000.

Date, Nobuaki, to Canon Kabushiki Kaisha. Film wind-up mechanism releasing device. 4,145,011, Cl. 242-71.600.

Datwyler, Walter F., Jr., to Bendix Corporation, The. Simultaneously resonated, multi-mode crystal force transducer. 4,144,747, Cl. 73-141.00R.

Daude-Lagrave, Marie-Christine: *See*—
Demarcq, Michel; Bakes, Michel; and Daude-Lagrave, Marie-Christine, 4,145,305, Cl. 252-186.000.

David Brown Tractors Limited: *See*—
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David, Don B.: *See*—
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Davy, Thomas E., to Nichols Engineering & Research Corporation. Method and apparatus for sewage treatment plants. 4,145,278, Cl. 210-10.000.

Day, Edward A.; Seay, Glenn E.; and Ritter, Perry B., to Systems, Science and Software. Delay detonator device. 4,144,814, Cl. 102-28.00R.

DDSA Pharmaceuticlas Ltd.: *See*—
Shenoy, Umakant D., 4,145,417, Cl. 424-244.000.

Dea, Iain C. M.; and Finney, David J., to Thomas J. Lipton, Inc. Stabilized spoonable ice cream. 4,145,454, Cl. 426-565.000.

Dean, Robert O., to Spiral-Craft. Bracket assembly. 4,144,683, Cl. 52-182.000.

De Baun, Mary. Material marker. 4,144,651, Cl. 33-189.000.

De Bijl, Adrianus M. J.; and Cramwinckel, Hans, to U.S. Philips Corporation. Address conversion device for secondary memories. 4,145,745, Cl. 364-200.000.

Debord, Pierre: *See*—
Beaudouin, Pierre L.; and Debord, Pierre, 4,145,721, Cl. 358-213.000.

DEC International, Inc.: *See*—
Lenhardt, Roy A., Sr., 4,145,453, Cl. 426-516.000.

DeCaro, Aristide R.; and Rainone, Nicholas J., to Westinghouse Electric Corp. Halogen-cycle type incandescent lamp. 4,145,630, Cl. 313-273.000.

de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Self-centering clutch bearings. 4,144,957, Cl. 192-98.000.

De Haitre, Lon, to Abbott/Interfast Corporation. Terminal assembly with captive self-emergent screw post. 4,145,107, Cl. 339-263.00R.

Dehnert, Johannes; and Dunkelmann, Guenter, to BASF Aktiengesellschaft. Water-soluble azo dyes containing diaminopyrimidine coupler components. 4,145,341, Cl. 260-154.000.

De Korte, Peter. Weatherproof changeable display device. 4,144,664, Cl. 40-609.000.

DeLeo, David B. Hair implanting method. 4,144,876, Cl. 128-1.00R.

DEMAG Aktiengesellschaft: *See*—
Becker, Klaus; Lichtenvort, Uwe; and Behrmann, Dieter, 4,145,042, Cl. 272-56.50R.

Demarcq, Michel; Bakes, Michel; and Daude-Lagrave, Marie-Christine, to Produits Chimiques Ugine Kuhlmann. Phosphorus activators for percompounds. 4,145,305, Cl. 252-186.000.

de Munck, Johannes W. J.: *See*—
Bussink, Jan; and de Munck, Johannes W. J., 4,145,377, Cl. 260-876.00B.

Den-Tal-Ez Mfg. Co.: *See*—
Valila, Veikko F., 4,145,611, Cl. 250-439.00P.

Denis, Marcel: *See*—
Petitjean, Christian H.; Marchand, Maurice E.; and Denis, Marcel, 4,145,690, Cl. 343-6.50R.

Denki Onkyo Co., Ltd.: *See*—
Masuda, Noboru, 4,145,687, Cl. 340-365.00S.

Dennis, Jack B.: *See*—
Misunas, David P.; and Dennis, Jack B., 4,145,733, Cl. 364-200.000.

DeSoto, Inc.: *See*—
Beauchamp, Gerson E., 4,145,478, Cl. 428-481.000.
Sekmakas, Kazys; and Shah, Raj, 4,145,323, Cl. 260-29.300.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Amplitude generator for an electronic organ. 4,144,789, Cl. 84-1.240.

Deutsche Automobilgesellschaft mbH, Firma: *See*—
von Benda, Klaus, 4,145,482, Cl. 429-27.000.

Devienne, Fernand M. Source of ions of high mass, especially ions of uranium oxide UO_2. 4,145,629, Cl. 313-230.000.

Devine, Thomas M., Jr., to General Electric Company. Composite substrate for rotating x-ray anode tube. 4,145,632, Cl. 313-330.000.

deVry, William E.; Drake, Ralph S.; and Morrissey, Richard T., to B. F. Goodrich Company, The. Polyurethane pressure-sensitive adhesive and laminates therefrom. 4,145,514, Cl. 528-75.000.

De Winter, Walter F.: *See*—
Timmerman, Daniel M.; De Winter, Walter F.; and Van Hoof, Albert E., 4,145,220, Cl. 96-84.00A.

Dexter, Robin W.: *See*—
Robinson, Peter M.; Coville, Michael W. C.; and Dexter, Robin W., 4,145,495, Cl. 526-93.000.

Dholakia, Anil R.; and Alexander, John, to RCA Corporation. Video disc pickup with preplay stylus. 4,145,718, Cl. 358-128.000.

Diab, Khaled M. Method and system for 5-bit encoding of complete Arabic-Farsi languages. 4,145,570, Cl. 178-30.000.

Diamond Shamrock Corporation: *See*—
Holm, Robert E., 4,145,209, Cl. 71-92.000.

Dice, Charles A., to Serel Corporation. Modular dynamic burn-in apparatus. 4,145,620, Cl. 307-149.000.

DiCiurcio, John A., to RCA Corporation. Voltage level generator using digital integration. 4,145,743, Cl. 364-605.000.

Didier Engineering GmbH: *See*—
Grewe, Heinz-Gunther; Seeberg, Horst; Fach, Horst; and Isermann, Friedrich, 4,145,257, Cl. 202-241.000.

Dietrich, Ralph N.: *See*—
Robinson, John W.; and Dietrich, Ralph N., 4,144,787, Cl. 84-1.010.

Dits, Herbert R. Control device for the speed control of pneumatic and/or hydraulic working pistons. 4,144,904, Cl. 137-625.300.

Dixon, Bernard, to Dixon International Limited. Fire resistant seals. 4,144,688, Cl. 52-232.000.

Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., to Air Products and Chemicals, Inc. End capped polyalkylene carbonates. 4,145,525, Cl. 528-404.000.

Dixon International Limited: *See*—
Dixon, Bernard, 4,144,688, Cl. 52-232.000.

Doan, Robert B., to Atlantic Richfield Company. Detergent-containing cleansing article. 4,145,302, Cl. 252-91.000.

Dobson, Charles J.: *See*—
Auchinleck, Richard J.; Schisselbauer, John C.; Garczynski, John S.; Jablanofsky, Charles C.; and Dobson, Charles J., 4,145,606, Cl. 235-477.000.

Dobson, James H. Apparatus for preventing accidental disconnection of electrical cords. 4,145,105, Cl. 339-75.00P.

Dockner, Toni: *See*—
Wetzler, Matthias; and Dockner, Toni, 4,145,553, Cl. 548-338.000.

Dr. Beck & Co. AG: *See*—
Kertscher, Eberhard; and Janssen, Harald, 4,145,474, Cl. 428-379.000.
Schmidt, Karl; Hansch, Ferdinand; and Rombrecht, Hans-Malte, 4,145,351, Cl. 260-326.00N.

Dr. Beck & Co., A.G.: *See*—
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 4,145,334, Cl. 528-189.000.

Doherty, John, Jr.: *See*—
Wakabayashi, Makoto; and Doherty, John, Jr., 4,144,998, Cl. 236-48.00R.

Doi, Shigemitsu, to I. S. Engineering Co., Ltd. Fluorescent lamp driving circuit. 4,145,636, Cl. 315-101.000.

Dokukin, Alexandr V.: *See*—
Sidorovich, Vladimir G.; Dokukin, Alexandr V.; Shmarian, Evgeny M.; Kazakov, Vladimir V.; and Lepikhov, Alexandr I., 4,145,744, Cl. 364-554.000.

Dolch, Ronald G.; and Kerr, Robert N., Jr., to Firestone Tire & Rubber Company, The. Pressure-sensitive antistatic adhesive and process for the preparation thereof using an aqueous latex copolymer and a quaternary ammonium salt. 4,145,327, Cl. 260-29.6MN.

Domingo, Mercedes A.: *See*—
Jarque, Ricardo G.; Domingo, Mercedes A.; Cartes, Juan Bosch; Roldan, Cristobal M.; and Peinado, Fernando R., 4,145,424, Cl. 424-256.000.

Domori, Yoshiki: *See*—
Tatara, Seiji; Domori, Yoshiki; Kumoda, Masashi; and Endo, Yusuke, 4,145,306, Cl. 252-187.00H.

Donaldson, John G.: *See*—
Phillips, Paul M.; and Donaldson, John G., 4,144,629, Cl. 29-420.500.

Donegan, James. Defrost indicator. 4,144,834, Cl. 116-219.000.

Donon, Jerome, to Compagnie General d'Electricite S.A. Device for maintaining a separation between two electric conductors. 4,145,565, Cl. 174-28.000.

Dorina Nahmaschinen GmbH: *See*—
Meier, Gunter, 4,144,828, Cl. 112-210.000.
Stehlin, Bernhard; and Wilken, Joachim, 4,144,826, Cl. 112-158.00E.

Doryokuro Kakunenryo Kaihatsu-Jigyodan: *See*—
Nakamoto, Koichiro; Ohyama, Nobumi; Adachi, Kiyoshi; and Kuwahara, Hajime, 4,144,741, Cl. 73-19.000.

Doucette, Richard L., to Burroughs Corporation. Current mode logic compatible emitter function type logic family. 4,145,623, Cl. 307-289.000.

Doure Ski Binding Company: *See*—
Berlied, Henry P., Jr., 4,145,070, Cl. 280-615.000.

Dovman, Nathan. Window construction. 4,144,674, Cl. 49-417.000.

Dow Chemical Company, The: *See*—
Boozalis, Theodore S.; and Ivy, John B., 4,145,367, Cl. 260-652.00P.
Steele, John M.; Nino, Guillermo J.; and Hanak, Fredric M., 4,145,260, Cl. 203-14.000.

Dow Corning Corporation: *See*—
Homan, Gary R.; and Toporcer, Louis H., 4,145,359, Cl. 260-448.20N.

Downey, Robert A.: *See*—
Kirkbride, Bernard J.; Downey, Robert A.; Thomasson, Charles V.; and Lewis, Joseph E., 4,144,684, Cl. 52-204.000.

Drake, Ralph S.: *See*—
deVry, William E.; Drake, Ralph S.; and Morrissey, Richard T., 4,145,514, Cl. 528-75.000.

Drake, Ronald, to Coventry Climax Limited. Suspension systems for vehicles. 4,144,978, Cl. 414-544.000.
Drexler, Halbert H. Display and dispenser. 4,144,662, Cl. 40-10.00D.
Drexler, Jerome; and Betz, Carl R., to Drexler Technology Corporation. Error checking method and apparatus for digital data in optical recording systems. 4,145,758, Cl. 365-200.000.
Drexler Technology Corporation: *See*—
Drexler, Jerome; and Betz, Carl R., 4,145,758, Cl. 365-200.000.
Driscoll, Stanley: *See*—
Groff, James; and Driscoll, Stanley, 4,145,175, Cl. 425-377.000.
Druschke, Frank: *See*—
Neukam, Theo; Druschke, Frank; Bentz, Francis; and Nischk, Gunther, 4,145,500, Cl. 526-204.000.
Du Pont of Canada Limited: *See*—
Fletcher, Eldon L., 4,144,818, Cl. 104-172.00B.
Dubs, Werner. Brush for the cleaning of firearm bores and gun barrels. 4,144,609, Cl. 15-104.200.
Duhl, Daniel; and Wall, Denton B., to Polylok Corporation. Knitted Malimo type fabric. 4,144,727, Cl. 66-192.000.
Dumovich, Matt J. Teaching aid for mathematics and number systems. 4,144,657, Cl. 35-31.00D.
Dunkelberger, David L.: *See*—
Myers, Robert M.; Dunkelberger, David L.; and Carty, Daniel T., 4,145,380, Cl. 260-879.000.
Dunkelmann, Guenter: *See*—
Dehnert, Johannes; and Dunkelmann, Guenter, 4,145,341, Cl. 260-154.000.
Dunn, Edward E. Pipe plugging device and method. 4,144,908, Cl. 138-93.000.
Dunning, Donald R.; Koplow, Harold S.; Moros, David; Wang, An; and Wild, A. Edward, Jr., to Wang Laboratories, Inc. Distributed data processing system. 4,145,739, Cl. 364-200.000.
Du Pont de Nemours, E. I., and Company: *See*—
Bostwick, Joseph H., 4,145,183, Cl. 8-111.000.
Burns, Richard C.; and Johnson, Alexander L., 4,145,527, Cl. 536-4.000.
Campo, Edgar A.; and Lewis, Robert B., 4,144,618, Cl. 19-161.100.
Harris, John F., Jr.; and Sharkey, William H., 4,145,490, Cl. 526-19.000.
Ryan, Donald J., 4,145,491, Cl. 526-31.000.
Samuelson, Harry V.; and Smiley, Dean H., 4,145,473, Cl. 428-373.000.
Vassiliou, Eustathios; and Van Hoeven, William, Jr., 4,145,325, Cl. 260-29.60F.
Duraiswamy, Kandaswamy: *See*—
Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; and Winter, Bruce L., 4,145,274, Cl. 208-8.000.
Durant, Graham J.: *See*—
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,145,546, Cl. 544-310.000.
Durr, Heinrich: *See*—
Haubrich, Lothar; and Durr, Heinrich, 4,145,145, Cl. 400-124.000.
Duxbury, William G. Analyzing plastic concrete. 4,144,762, Cl. 73-432.00R.
Dybas, Richard A.: *See*—
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., 4,145,426, Cl. 424-267.000.
Dyer, Billy F., to Hughes Tool Company. Heat shield for a drill string shock absorbing apparatus. 4,145,034, Cl. 267-125.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Bendler, Hellmut, 4,144,714, Cl. 60-632.000.
Dynapac Maskin AB: *See*—
Grane, Gunnar, 4,145,156, Cl. 404-113.000.
Dzaack, Heinz, to LKB-Produkter AB. Handpipette. 4,144,761, Cl. 73-425.600.
Dziura, Walter H.; and Kendall, Robert B., to Scovill Manufacturing Company. Fastener setting hand tool. 4,144,738, Cl. 72-410.000.
E. H. Wachs Company, The: *See*—
Wachs, Edward H.; and Kwech, Horst, 4,144,867, Cl. 125-14.000.
E M I Varian Limited: *See*—
Tuck, Richard A., 4,145,635, Cl. 315-5.390.
E. R. Squibb & Sons, Inc.: *See*—
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,145,431, Cl. 424-273.00B.
Haugwitz, Rudiger D.; and Cruthers, Larry R., 4,145,433, Cl. 424-273.00B.
Krapcho, John; and Turk, Chester F., 4,145,541, Cl. 544-111.000.
Vogt, B. Richard, 4,145,420, Cl. 424-248.500.
Eager, George S., Jr.: *See*—
Bahder, George; Eager, George S., Jr.; and Katz, Carlos, 4,145,567, Cl. 174-107.000.
Early, Judson H.: *See*—
Off, Joseph W. A.; and Early, Judson H., 4,145,388, Cl. 264-24.000.
Eastman Kodak Company: *See*—
Ford, John A., Jr.; Rossi, Louis J.; and Santilli, Domenic, 4,145,299, Cl. 252-62.10L.
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,145,518, Cl. 528-272.000.
Van Allan, James A.; Webster, Frank G.; and Reynolds, George A., 4,145,215, Cl. 96-1.0PE.
Yoerger, William E., 4,145,214, Cl. 96-1.0PC.
Ebauches SA: *See*—
Portmann, Hubert, 4,144,704, Cl. 58-23.0BA.
Eberhardt, Elwood L. Fish tackle tool. 4,144,605, Cl. 7-106.000.
Eckstein, Fritz; and Hobbs, John, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V. Process for producing 2'-substituted-D-ribofuranosyl purine compounds. 4,145,531, Cl. 536-26.000.
Eda, Masato: *See*—
Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, 4,144,861, Cl. 123-179.00G.
Eddy, Richard P., to Christie Electric Corp. Film tensioning device. 4,144,991, Cl. 226-195.000.
Ederer Incorporated: *See*—
Longthorpe, Paul L., 4,144,974, Cl. 212-18.000.
Edgington, Thomas S.; and Plow, Edward F., to Scripps Clinic and Research Foundation. Carcinoembryonic antigen isomer. 4,145,336, Cl. 260-112.00R.
Edwards, Earl G.; and Peterson, Charles E., to International Business Machines Corporation. Apparatus to facilitate jam recovery and hot roll reversal in a fusing assembly. 4,145,181, Cl. 432-60.000.
Egan, Wayne J.: *See*—
Angner, Ronald J.; Egan, Wayne J.; Gordon, Alan M.; and Huryn, William A., 4,145,579, Cl. 179-81.00R.
Egging Company, The: *See*—
Meyer, Gustave, 4,144,980, Cl. 414-725.000.
Egnell, Rolf A.; and Moritz, Mats I., to Kommanditbolaget United Stirling (Sweden) AB & Co. Method and apparatus for decreasing nitrogen oxides and unburnt hydrocarbons when burning hydrocarbon fuels. 4,145,178, Cl. 431-11.000.
Eguchi, Seiji: *See*—
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,145,755, Cl. 364-900.000.
Ehrat, Kurt, to Gretag Aktiengesellschaft. Method and apparatus for ciphering and deciphering messages. 4,145,568, Cl. 178-22.000.
Ehrat, Kurt, to Gretag Aktiengesellschaft. Method and apparatus for synchronizing the ciphering and deciphering of binary-coded messages. 4,145,569, Cl. 178-22.000.
Eichelberger, Charles W.; and Butler, Walter J., to General Electric Company. Self-optimizing touch pad sensor circuit. 4,145,748, Cl. 364-862.000.
Eisenberg, Joel H. Ski boot. 4,144,659, Cl. 36-120.000.
Ek, Lars: *See*—
Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., 4,145,442, Cl. 424-330.000.
Ekemar, Carl S. G.: *See*—
Oskarsson, Rolf G.; and Ekemar, Carl S. G., 4,145,213, Cl. 75-238.000.
Eldin, Sameer H.; Seiz, Wolfgang; and Forster, Ewald, to Ciba-Geigy Corporation. Composition, for the treatment of paper, which contains hydantoin compounds and an amine curing agent. 4,145,247, Cl. 162-136.000.
Electric Power Research Institute, Inc.: *See*—
Mitchell, George F., Jr., 4,145,679, Cl. 336-57.000.
Electronic Management Support, Inc.: *See*—
Clever, Eric C., 4,145,715, Cl. 358-108.000.
Electrospace Systems, Inc.: *See*—
Fenwick, Richard C., 4,145,693, Cl. 343-722.000.
Elf Union: *See*—
Maldonado, Paul; Mas, Jean; and Phung, Trung K., 4,145,322, Cl. 260-28.5AS.
Eli Lilly and Company: *See*—
Jones, Reuben G.; and Terando, Norman H., 4,145,554, Cl. 548-377.000.
Marshall, Winston S., 4,145,557, Cl. 560-164.000.
McKnight, Hugh P.; and Hostetler, Van B., 4,144,970, Cl. 209-542.000.
Nagarajan, Ramakrishnan, 4,145,538, Cl. 544-16.000.
Eller, Thomas: *See*—
Parsons, George H., Jr.; and Eller, Thomas, 4,145,407, Cl. 424-1.000.
Ellwanger, Charles G.; and Pedersen, Harry, to Gleason Works, The. Method for resharpening cutting blades for gear cutting machinery. 4,144,678, Cl. 51-288.000.
Elton, Robert L.: *See*—
Crone, Richard L.; and Elton, Robert L., 4,145,112, Cl. 350-103.000.
Elyashar, Daniel: *See*—
Trussell, Gerald C.; Arnston, Robert W.; and Elyashar, Daniel, 4,145,746, Cl. 364-551.000.
Emerton, Barry G.; Weir, William A.; and McLean, Thomas F., to Chloride Batteries Australia Limited. Casting plate straps and/or intercell connectors of electric storage batteries. 4,144,927, Cl. 164-108.000.
Emmett, John C.: *See*—
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,145,546, Cl. 544-310.000.
Emmons, William D.; and Nyi, Kayson, to Rohm and Haas Company. Autoxidizable compositions. 4,145,503, Cl. 526-282.000.
Endo, Yusuke: *See*—
Tatara, Seiji; Domori, Yoshiki; Kumoda, Masashi; and Endo, Yusuke, 4,145,306, Cl. 252-187.00H.
Endstra, Willem C., to Akzona Incorporated. Cross-linkable organopolysiloxane compositions and a process for cross-linking organopolysiloxanes. 4,145,505, Cl. 528-10.000.
Energy Conversion Systems Limited: *See*—
Solbakken, Age, 4,145,189, Cl. 44-51.000.
Entner, Josef: *See*—
Richter, Martin; and Entner, Josef, 4,144,796, Cl. 85-61.000.

Erck, Louis J.: *See—*
Kunchal, S. Kumar; Erck, Louis J.; and Harris, Harry A., 4,145,191, Cl. 55-4.000.

ERCO Industries Limited: *See—*
Swindells, Richard; and Fredette, Maurice C. J., 4,145,401, Cl. 423-478.000.

ESB Incorporated: *See—*
Zender, James P., 4,145,648, Cl. 320-25.000.

Esenovsky-Lashkov, Jury K.: *See—*
Polyak, David G.; Lebedev, Evgeny I.; Esenovsky-Lashkov, Jury K.; Pyatko, Boris N.; and Mosyagin, Vladimir M., 4,144,958, Cl. 192-105.00F.

Espenscheid, Wilton F.; and Yan, Tsoung Y., to Mobil Oil Corporation. Liquefaction of solid organic wastes. 4,145,188, Cl. 44-50.000.

Essex Group, Inc.: *See—*
Bendorf, Dwaine L., 4,145,180, Cl. 431-46.000.

Estkowski, Michael H., to Clark Equipment Company. Engine starting system. 4,144,862, Cl. 123-196.00S.

Etablissements Francois Salomon et Fils: *See—*
Salomon, Georges P. J., 4,145,071, Cl. 280-624.000.

Ethyl Corporation: *See—*
Zorzi, Paul A.; Allen, Thomas S.; and Kucsma, Michael E., 4,145,330, Cl. 260-37.00R.

Ethyl Development Corporation: *See—*
Kinslow, William G., 4,144,985, Cl. 220-254.000.

Etoh, Kuniomi; and Nanpei, Masaru, to Toyobo Co., Ltd. Water soluble photosensitive resin composition comprising a polyamide or its ammonium salt. 4,145,222, Cl. 96-115.00P.

Etudes et Recherches Avancees: *See—*
Garnier, Michel C., 4,144,955, Cl. 192-52.000.

Euteco S.p.A.: *See—*
Croce, Piero D.; Pellizzon, Tullio; Schwarz, Peter; and Piccolo, Luigi, 4,145,228, Cl. 106-304.000.

Evans, George S.; and Skwirut, Henry, to Westinghouse Electric Corp. Fluorescent lamp having integral mercury-vapor pressure control means. 4,145,634, Cl. 313-490.000.

Evans, Robert F., to Smith International, Inc. Down hole milling or grinding system. 4,144,936, Cl. 166-298.000.

Evers, William J.: *See—*
Mookherjee, Braja D.; Withycombe, Donald A.; Katz, Ira; Goossens, Alfred E.; Vock, Manfred H.; Evers, William J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,145,354, Cl. 260-347.200.

Ex-Cell-O Corporation: *See—*
Neumayer, Jack M.; and Kauffman, Ivan L., 4,145,236, Cl. 156-73.100.

Explosafe America Inc.: *See—*
Szego, Andrew; and Kallay, Victor, 4,144,624, Cl. 29-6.100.

Exxon Research & Engineering Co.: *See—*
Fung, Shun C.; and Pan, Yen-Chi, 4,145,314, Cl. 252-437.000.
Gardner, Irwin J., 4,145,492, Cl. 526-47.300.
Hall, Ralph R.; and Shaw, David H., 4,145,275, Cl. 208-33.000.
Langer, Arthur W., Jr., 4,145,313, Cl. 252-429.00B.
Lundberg, Robert D.; Makowski, Henry S.; and Bock, Jan, 4,145,379, Cl. 260-879.000.
Robson, Harry E., 4,145,316, Cl. 252-465.000.

F. J. Littell Machine Company: *See—*
Johnson, Kenneth C., 4,144,990, Cl. 226-154.000.

Fa. Lumoprint Zindler KG (GmbH & Co.): *See—*
Salger, Werner, 4,144,839, Cl. 118-658.000.

Facet Enterprises, Inc.: *See—*
Martin, William G.; and Simone, Anthony D., 4,145,285, Cl. 210-100.000.

Fach, Horst: *See—*
Grewe, Heinz-Gunther; Seeberg, Horst; Fach, Horst; and Isermann, Friedrich, 4,145,257, Cl. 202-241.000.

Fahey, Darryl R.; and Mahan, John E, to Phillips Petroleum Company. Preparation of organophosphorus nickel complexes. 4,145,358, Cl. 260-439.00R.

Fahey, Michael D.: *See—*
Goheen, David W.; and Fahey, Michael D., 4,145,246, Cl. 162-23.000.

Fairmont Steel Products, Inc.: *See—*
Leach, Clayton R., Jr.; and Munich, Terry L., 4,144,979, Cl. 414-537.000.

Falk, John C.: *See—*
Narducy, Kenneth W.; Falk, John C.; and Cohen, Murray S., 4,145,374, Cl. 260-873.000.

Farello, Luciano; Prada, Cesare; and Restori, Ettore, to WABCO Westinghouse. Electromagnetic rail brake for railway vehicles. 4,144,954, Cl. 188-165.000.

Farina, Attilio, to Indesit Industria Elettrodomestici Italiana S.p.A. Image display devices. 4,145,685, Cl. 340-782.000.

Farkas, Daniel S.; and Perry, Philip D., to Owens-Illinois, Inc. Timing pulse generator for a glassware forming machine. 4,145,204, Cl. 65-164.000.

Farkas, Daniel S.; and Ferenczy, Erwin M., to Owens-Illinois, Inc. Timing pulse generator for a glassware forming machine. 4,145,205, Cl. 65-164.000.

Farrall, Dennis L., to Olin Corporation. Method for recycling regenerated cellulose scrap. 4,145,533, Cl. 536-60.000.

Farrar, Ralph C., to Phillips Petroleum Company. Addition of coupling agent during organolithium initiated polymerizations. 4,145,498, Cl. 526-178.000.

Fasullo, Eugene J.; and Hahn, Daniel M., to Port Authority of New York and New Jersey, The. Method of replacing a roadway. 4,145,153, Cl. 404-73.000.

Fattler, Kurt: *See—*
Mucha, Horst; Arnoldi, Wilhelm; Fattler, Kurt; Overath, Albrecht; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; and Audi, Josef, 4,145,723, Cl. 360-79.000.

Federal Paper Board Co., Inc.: *See—*
Kulig, Francis V., 4,144,966, Cl. 206-188.000.

Felix, Arthur M.: *See—*
Dairman, Wallace M.; Felix, Arthur M.; Gallo-Torres, Hugo E.; Heimer, Edgar P.; and Meienhofer, Johannes A., 4,145,337, Cl. 260-112.50S.

Fellowes Manufacturing Company: *See—*
Klaus, Gerald R., 4,145,100, Cl. 312-261.000.

Felter, John V., to Midcon Pipeline Equipment Co. Combined chuck wrench and electric plug. 4,145,102, Cl. 339-14.00P.

Feltgen, Karlheinz; Kaluza, Hans J.; Muschelknautz, Edgar; and Simon, Hans J., to Bayer Aktiengesellschaft. Process for the continuous polymerization of lactams with static mixers. 4,145,520, Cl. 528-323.000.

Fenwick, Richard C., to Electrospace Systems, Inc. Three band monopole antenna. 4,145,693, Cl. 343-722.000.

Ferdelman, Donald C., to General Motors Corporation. Timer for heat-cool room air conditioner. 4,144,930, Cl. 165-12.000.

Ferenczy, Erwin M.: *See—*
Farkas, Daniel S.; and Ferenczy, Erwin M., 4,145,205, Cl. 65-164.000.

Fermenich, Dennis R.: *See—*
Quast, Danny H.; Fermenich, Dennis R.; and Granof, Herman H., 4,144,673, Cl. 47-57.500.

Fernandes, Marilyn M. Flat contour sheet. 4,144,602, Cl. 5-334.00C.

Ferranti Limited: *See—*
Colaco, Stephen F., 4,145,621, Cl. 307-215.000.

Ferrara, Peter J. Method of modifying the properties of cereal flours and the modified flours so produced. 4,145,225, Cl. 106-154.00R.

Ferrario, Bruno: *See—*
Porta, Paolo D.; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 4,145,355, Cl. 260-348.340.

Ferrero, Francesco; Sironi, Giuseppe; and Viviani, Bruno, to Montedison S.p.A. Process for the preparation of thermostable black and brown pigments and the pigments so produced. 4,145,229, Cl. 106-304.000.

Ferro, Armand P.; Harnden, John D., Jr.; and McLaughlin, Michael H., to General Electric Company. Power module with isolated substrates cooled by integral heat-energy-removal means. 4,145,708, Cl. 357-82.000.

Ferruti, Paolo; and Paoletti, Rodolfo. Polymers containing polyunsaturated acid radicals, process for their preparation and use thereof. 4,145,320, Cl. 260-23.0AR.

Fertilizers & Chemicals Ltd.: *See—*
Gulko, Arie; and Greidinger, Dahlia S., 4,145,208, Cl. 71-29.000.

Fey, Maurice G.; and Wolf, Charles B. Arc heater method for producing metal oxides. 4,145,403, Cl. 423-613.000.

Fiber Materials, Inc.: *See—*
Kendall, Ernest G.; and Pepper, Roger T., 4,145,471, Cl. 428-366.000.

Fifth Patroy Proprietory Ltd.: *See—*
Lukey, Leonard F., 4,145,023, Cl. 248-479.000.

Filippov, Vyacheslav V.: *See—*
Rabinovich, Volf I.; Kriger, Jury N.; Sapozhnikov, Alexandr I.; Svitenko, Igor A.; Sapunov, Viktor E.; Filippov, Vyacheslav V.; and Karpov, Vladimir A., 4,145,563, Cl. 13-9.0ES.

Filterwerk Mann & Hummel GmbH: *See—*
Bendig, Lothar; and Klotz, Arthur, 4,144,857, Cl. 123-122.00D.

Filzinger, Klaus: *See—*
Fuchs, Hermann; and Filzinger, Klaus, 4,145,339, Cl. 260-148.000.

Finley, Donald W.; and Lewis, Robert B., to Western Electric Company, Inc. Method of fabricating a printed circuit board with etched through holes. 4,145,460, Cl. 427-97.000.

Finney, David J.: *See—*
Dea, Iain C. M.; and Finney, David J., 4,145,454, Cl. 426-565.000.

Fiore, Joseph V., to AMF Incorporated. Solvent extraction process. 4,144,895, Cl. 131-143.000.

Firestone Tire & Rubber Company, The: *See—*
Dolch, Ronald G.; and Kerr, Robert N., Jr., 4,145,327, Cl. 260-29.6MN.

Fischer, Heinz. Plug connection. 4,145,104, Cl. 339-65.000.

Fisher, Stanton E.; and Weinrich, Bernard W., to said Stanton E. Fisher; by said Bernard W. Weinrich. Highly compacted animal food system. 4,145,447, Cl. 426-72.000.

Fisons Limited: *See—*
Kingsley, Patrick J.; and Orr, Thomas S. C., 4,145,438, Cl. 424-283.000.

Fitch, Kandy A.; and Rowe, Englebert L., to Upjohn Company, The. Liquid suspension of an aluminum salt of ibuprofen. 4,145,440, Cl. 424-287.000.

Fitch, Steven J.; and Peeling, Philip R., to SCM Corporation. Deactivating particulate waste containing hydrolyzable metal chlorides. 4,145,395, Cl. 423-1.000.

Fleck, Raymond N.; and Hennig, Harvey, to Union Oil Company of California. Method of producing mechanical energy from geothermal fluids. 4,144,715, Cl. 60-641.000.

Fletcher, Eldon L., to Du Pont of Canada Limited. Storage system for wheeled buggies and apparatus therefor. 4,144,818, Cl. 104-172.00B.

Fodor, Lajos: *See—*
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal,

Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.
Fogelberg, Mark J.; and Roberts, Richard W., to Borg-Warner Corporation. Variable capacity wobble plate compressor. 4,145,163, Cl. 417-222.000.
Fontaine, Albert M. Method of controlling the properties of a mixture. 4,145,143, Cl. 366-40.000.
Fontanes, Sylvain: *See*—
Benoit-Gonin, Roger; Berger, Jean L.; and Fontanes, Sylvain, 4,145,676, Cl. 333-165.000.
Ford, John A., Jr.; Rossi, Louis J.; and Santilli, Domenic, to Eastman Kodak Company. Electrographic liquid developers containing azo dye marking particles derived from 2,3-naphthalenediol or derivatives thereof. 4,145,299, Cl. 252-62.10L.
Ford, Michael E.: *See*—
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,145,525, Cl. 528-404.000.
Ford Motor Company: *See*—
Abdoo, Richard V., 4,144,863, Cl. 123-198.00F.
Siegl, Walter O., 4,145,523, Cl. 528-395.000.
Ford, Stuart, to Stuart Ford Incorporated. Pellet for growing seed and process for making same. 4,145,206, Cl. 71-23.000.
Foremost-McKesson, Inc.: *See*—
Console, Ortha M.; and Griffin, Alvah M., 4,145,291, Cl. 210-232.000.
Forster, Ewald: *See*—
Eldin, Sameer H.; Seiz, Wolfgang; and Forster, Ewald, 4,145,247, Cl. 162-136.000.
Fort Wayne Wire Die, Inc.: *See*—
Corbin, Lawrence W., 4,144,739, Cl. 72-467.000.
Fournier, Yves: *See*—
Mercier, Alain; and Fournier, Yves, 4,145,237, Cl. 156-107.000.
Fox, Robert C. Building construction. 4,144,685, Cl. 52-223.00R.
Fox, Thomas U.; and Kasten, Nelson H., to Monsanto Company. Weather-durable aqueous fire retardant stabilized against gelation. 4,145,296, Cl. 252-8.100.
Franck, Jean-Pierre: *See*—
Cosyns, Jean; and Franck, Jean-Pierre, 4,145,276, Cl. 208-57.000.
Franks, Gerald M.; and Haswell, John W., to Master Craft Engineering, Inc. Method and apparatus for forming one-piece pulleys. 4,144,732, Cl. 72-84.000.
Franks, Neal E.; and Varga, Julianna K., to Akzona Incorporated. Process for making precipitated cellulose. 4,145,532, Cl. 536-56.000.
Frankshun, Robert A.: *See*—
Jones, Howard; and Frankshun, Robert A., 4,145,346, Cl. 260-239.55C.
Fredette, Maurice C. J.: *See*—
Swindells, Richard; and Fredette, Maurice C. J., 4,145,401, Cl. 423-478.000.
Freeling, Marvin R.; and Wolkstein, Herbert J., to RCA Corporation. RF Burst signal recirculation memory system having a diplexed feedback loop. 4,145,691, Cl. 343-7.0AG.
Freeman, William R., Jr.: *See*—
Gupta, Dinesh K.; Dardi, Louis E.; and Freeman, William R., Jr., 4,145,481, Cl. 428-678.000.
Frei, Ephraim H.; Sollish, Bruce D.; and Yerushalmi, Shmuel, to Yeda Research and Development Co. Ltd. Instrument for visoelastic measurement. 4,144,877, Cl. 128-2.00S.
French, James M.; and Thrasher, Samuel R., to General Motors Corporation. Regenerator disc drive. 4,144,929, Cl. 165-8.000.
Freshour, Kenneth D.: *See*—
Weimer, Dean R.; and Freshour, Kenneth D., 4,145,496, Cl. 526-62.000.
Fripiat, Jose J.: *See*—
Bruylants, Philippe M.; Fripiat, Jose J.; Rodrigue, Luc W.; Poncelet, Georges M.; and Munaut, Antonin A., 4,145,301, Cl. 252-62.560.
Fritschi, Willi, to Daimler-Benz Aktiengesellschaft. Lateral bottoms for headrests, seat cushions or the like in motor vehicles. 4,144,604, Cl. 5-360.000.
Frohberger, Paul-Ernst: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,145,428, Cl. 424-269.000.
Fruehauf Corporation: *See*—
Miller, Frank J.; and Vij, Hem R., 4,145,080, Cl. 296-183.000.
Fuchs, Hermann; and Filzinger, Klaus, to Hoechst Aktiengesellschaft. Water-soluble 1:2-cobalt complex dyestuffs of an azomethine and of an azo compound. 4,145,339, Cl. 260-148.000.
Fuchslin, Stefan: *See*—
Taber, Loren H.; Neilson, David R.; and Fuchslin, Stefan, 4,145,085, Cl. 298-5.000.
Fuji Fine Chemical Co. Ltd.: *See*—
Toida, Shigeo; Ohno, Akira; Higuchi, Kozo, deceased; Higuchi, Makoto, heir at law; and Higuchi, Yuko, heir at law, 4,145,397, Cl. 423-54.000.
Fuji Oil Company, Limited: *See*—
Fujimaki, Masao; Arai, Soichi; Watanabe, Michiko; Hashimoto, Yukio; and Kurooka, Akira, 4,145,455, Cl. 426-614.000.
Fuji Photo Film Co., Ltd.: *See*—
Iwasa, Masakazu; Matsumoto, Seiji; Honjo, Satoru; and Iida, Teruo, 4,144,808, Cl. 101-1.000.
Kato, Takeshi; Tanaka, Akira; Hayashi, Jun; and Mikawa, Akikazu, 4,145,219, Cl. 96-74.000.
Fujii, Hitoshi. Measurement of surface roughness. 4,145,140, Cl. 356-360.000.
Fujii, Toshihiko, to Nissan Motor Company, Limited. Method and apparatus for production of laminated and shaped wall covering board of corrugated paperboard base. 4,145,239, Cl. 156-212.000.
Fujimaki, Masao; Arai, Soichi; Watanabe, Michiko; Hashimoto, Yukio; and Kurooka, Akira, to Fuji Oil Company, Limited. Modified protein compositions and preparation thereof. 4,145,455, Cl. 426-614.000.
Fujio, Masaaki. Method and apparatus for fitting heat shrinkable film seals to necks of vessels. 4,144,631, Cl. 29-446.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Hattori, Kiyoshi; and Mitamura, Takashi, 4,145,539, Cl. 544-20.000.
Sato, Yoshinari, 4,145,432, Cl. 424-266.000.
Fujishiro, Koretoshi; and Hiyoshi, Masamitsu, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Apparatus for preventing gas leakage from oven door of coke oven. 4,145,258, Cl. 202-248.000.
Fujitsu Limited: *See*—
Inoue, Koichi; Nonogaki, Hajime; Urakawa, Tatsuo; and Shimizu, Kazuyuki, 4,145,738, Cl. 364-200.000.
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.
Yasuda, Hiroshi, 4,145,597, Cl. 219-121.0EB.
Yoshimura, Tatsuro; Tsuchimoto, Takamitsu; and Hamada, Katsuyuki, 4,145,749, Cl. 364-900.000.
Fukase, Yasuji; and Nishide, Hiroo, to Rank Xerox Limited. Contact heat fixing apparatus. 4,144,835, Cl. 118-5.000.
Fukaya, Hiroyasu: *See*—
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, 4,145,608, Cl. 250-231.0SE.
Fukuchi, Noboru: *See*—
Kuwabara, Masamichi; Sasaki, Mitsuo; Uema, Sigeru; Taniguchi, Youkichi; Fukuchi, Noboru; and Kimura, Tohru, 4,145,462, Cl. 427-160.000.
Fukuda, Shiro: *See*—
Takahashi, Hiroshi; Muto, Yasutami; Suzuki, Hiroshi; and Fukuda, Shiro, 4,144,675, Cl. 51-76.00R.
Fukuhara, Yoshinori: *See*—
Nakata, Jyoichi; Chiba, Yasumasa; Seto, Tetsuhiko; and Fukuhara, Yoshinori, 4,145,265, Cl. 204-98.000.
Fukui, Hirokazu, to Kubota Kekko Kabushiki Kaisha. Impact type crusher. 4,145,009, Cl. 241-194.000.
Fukuoka, Mitsuhiro, to Sakura Color Products Corporation. Ball-point pen for a low-viscosity ink. 4,145,148, Cl. 401-209.000.
Fung, Shun C.; and Pan, Yen-Chi, to Exxon Research & Engineering Co. Preparation of highly dispersed supported group VIII metal catalysts and the redispersion of sintered or agglomerated supported group VIII metal catalysts by the addition of phosphorus. 4,145,314, Cl. 252-437.000.
Funke, Maurice F.; and Goto, John M., to United States of America, Army. Programmable fluidic pressure-to-electronic interface system. 4,144,906, Cl. 137-819.000.
Furukawa, Kazuo: *See*—
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.
Furusawa, Michito: *See*—
Toyomasu, Takeshi; Furusawa, Michito; Mabuchi, Sadao; and Gushima, Mitsuo, 4,145,068, Cl. 280-281.00R.
Fushimi, Shigeo: *See*—
Shida, Seiya; Fushimi, Shigeo; and Sato, Masao, 4,145,575, Cl. 179-15.0FD.
G. D. Societa per Azioni: *See*—
Seragnoli, Enzo, 4,144,695, Cl. 53-234.000.
Gaechter, Jean-Pierre; Bourdeau, Charles; and Vialaret, Guy, to Agence Nationale de Valorisation de la Recherche (ANVAR). Altazimuth orientation support. 4,145,021, Cl. 248-371.000.
GAF Corporation: *See*—
Chuang, Jui-Chang; and Trucker, Donald E., 4,145,221, Cl. 96-95.000.
Loofbourow, Donald I.; and Lach, Robert E., 4,145,127, Cl. 352-79.000.
Gal, Sandor: *See*—
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.
Gall, Richard C.: *See*—
Guif, Stanley E.; Nimmer, Terry L.; Weigt, Donald A.; Wolenec, Glenn; and Gall, Richard C., 4,145,717, Cl. 358-121.000.
Gallo, Luigi C., to Ampex Corporation. Television subcarrier phase correction for color field sequencing. 4,145,704, Cl. 358-8.000.
Gallo, Mario, to Wirth, Gallo & Co. Scale, in particular for weighing bulk goods. 4,144,943, Cl. 177-210.0FP.
Gallo-Torres, Hugo E.: *See*—
Dairman, Wallace M.; Felix, Arthur M.; Gallo-Torres, Hugo E.; Heimer, Edgar P.; and Meienhofer, Johannes A., 4,145,337, Cl. 260-112.50S.
Ganellin, Charon R.: *See*—
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,145,546, Cl. 544-310.000.
Gans, Michael J., to Bell Telephone Laboratories, Incorporated. Launcher reflectors for correcting for astigmatism in off-axis fed reflector antennas. 4,145,695, Cl. 343-779.000.
Garczynski, John S.: *See*—
Auchinleck, Richard J.; Schisselbauer, John C.; Garczynski, John S.; Jablanofsky, Charles C.; and Dobson, Charles J., 4,145,606, Cl. 235-477.000.
Gardner, Irwin J., to Exxon Research & Engineering Co. Catalytic

dehydrohalogenation process for allylically halogenated unsaturated hydrocarbon polymers. 4,145,492, Cl. 526-47.300.

Gardner, William L. Inclinometer. 4,144,653, Cl. 33-391.000.

Garnier, Michel C., to Etudes et Recherches Avancees. Multiple disc torque transmission device in oil. 4,144,955, Cl. 192-52.000.

Gatti, Anthony R.; Hokanson, James S.; and Nozaki, Kenzie, to Shell Oil Company. Fuel and lubricant compositions for inhibition or prevention of octane requirement increase. 4,145,297, Cl. 252-25.000.

Gaudiano, Anthony V.: *See—*
Wallace, Kenneth W.; and Gaudiano, Anthony V., 4,144,801, Cl. 98-1.500.

Gay, Jean: *See—*
Mosky, Nicolas; Gay, Jean; and Vigneau, Paul, 4,144,647, Cl. 33-12.000.

Gearhart, Walter S. Cyclic-action, siphon-operated buoyant toy. 4,144,670, Cl. 46-91.000.

Genc, Robert R.: *See—*
Soika, Emil H.; and Genc, Robert R., 4,144,793, Cl. 84-291.000.

Gendelman, Bernard: *See—*
Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard, 4,145,720, Cl. 358-194.000.

General Atomic Company: *See—*
Morse, David C.; and Vrable, Daniel L., 4,144,723, Cl. 62-332.000.
Ohkawa, Tihiro; and Chin, Jack, 4,145,250, Cl. 176-3.000.

General Cable Corporation: *See—*
Bahder, George; Eager, George S., Jr.; and Katz, Carlos, 4,145,567, Cl. 174-107.000.

General Electric Company: *See—*
Bussink, Jan; and de Munck, Johannes W. J., 4,145,377, Cl. 260-876.00B.
Butler, Walter J.; and Puckette, Charles M., 4,145,689, Cl. 340-347.0AD.
Devine, Thomas M., Jr., 4,145,632, Cl. 313-330.000.
Eichelberger, Charles W.; and Butler, Walter J., 4,145,748, Cl. 364-862.000.
Ferro, Armand P.; Harnden, John D., Jr.; and McLaughlin, Michael H., 4,145,708, Cl. 357-82.000.
Juneau, Paul W., Jr.; and West, Martin M., 4,145,328, Cl. 260-30.40R.
Liebermann, Howard H., 4,144,926, Cl. 164-87.000.
Mark, Victor; and Wilson, Phillip S., 4,145,329, Cl. 260-30.40R.
Qurnell, Frank D., 4,145,251, Cl. 176-19.00R.
Simoneau, E. Thomas; and Sheridan, John J., Jr., 4,145,308, Cl. 252-321.000.
Vostovich, Joseph E., 4,145,475, Cl. 428-389.000.
Wolfram, Adolf E., 4,145,659, Cl. 325-468.000.

General Motors Corporation: *See—*
Ferdelman, Donald C., 4,144,930, Cl. 165-12.000.
French, James M.; and Thrasher, Samuel R., 4,144,929, Cl. 165-8.000.

General Tire & Rubber Company, The: *See—*
Neubert, Terry C., 4,145,494, Cl. 526-81.000.

Georg Fischer AG Brugg: *See—*
Bernath, Oskar, 4,144,836, Cl. 118-7.000.

Georg Fischer Aktiengesellschaft: *See—*
Wernli, Max, 4,144,925, Cl. 164-7.000.

Georgia Tech Research Institute: *See—*
Bowen, Mack D., 4,145,256, Cl. 201-25.000.

Gewerbebank Baden Aktiengesellschaft: *See—*
Jetzer, Raimund, 4,145,007, Cl. 241-24.000.

Giese, Hans G., to Rollei-Werke Franke & Heidecke. Capacitor charge indicator in an electronic photoflash. 4,145,637, Cl. 315-241.00P.

Gilain, Jacques: *See—*
Vanlautem, Noel; and Gilain, Jacques, 4,145,526, Cl. 528-481.000.

Gilbert Engineering Company, Inc.: *See—*
Hayward, Robert D., 4,145,729, Cl. 361-119.000.

Gilles, Jack C., to B. F. Goodrich Company, The. Hydroxyl-containing liquid polymers and pressure-sensitive adhesives and laminates prepared therefrom. 4,145,511, Cl. 528-73.000.

Gillette Company, The: *See—*
Buchholz, Alexis, 4,144,640, Cl. 30-221.000.
Usdin, Vera R.; and Kaszynski, Edwin, 4,145,413, Cl. 424-63.000.

Giovanelli, Armand: *See—*
Jaekle, William M.; Byrne, Robert; and Giovanelli, Armand, 4,144,820, Cl. 105-368.00R.

Giuliani, Giampaolo: *See—*
Arrighetti, Sergio; Brancaccio, Aldo; Cesca, Sebastiano; and Giuliani, Giampaolo, 4,145,378, Cl. 260-876.00R.

Glamorise Foundations, Inc.: *See—*
Pundyk, Bernard, 4,144,912, Cl. 128-484.000.

Gleason Works, The: *See—*
Ellwanger, Charles G.; and Pedersen, Harry, 4,144,678, Cl. 51-288.000.

Gloucester Engineering Co., Inc.: *See—*
Schott, Charles M., Jr., 4,145,177, Cl. 425-445.000.

GNT Automatic A/S: *See—*
Albrechtsen, Kaj, 4,145,589, Cl. 200-159.00R.

Go, Santos W., to Owens-Illinois, Inc. Linear copolyesters as packages for comestibles. 4,145,517, Cl. 528-173.000.

Goel, Jitendra, to RCA Corporation. Method of making a short gate field effect transistor. 4,145,459, Cl. 427-88.000.

Goetze AG: *See—*
Stecher, Friedhelm; Morsbach, Martin; and Johren, Paul, 4,145,060, Cl. 277-139.000.

Goheen, David W.; and Fahey, Michael D., to Crown Zellerbach Corporation. Process for making high-strength, high-yield sulfite-modified thermomechanical pulp and a linerboard composition produced therefrom. 4,145,246, Cl. 162-23.000.

Gold, William. Metallic beams reinforced by higher strength metals. 4,144,686, Cl. 52-225.000.

Goloskov, Emmanuil I.; Kott, Isaak M.; Maevsky, Genrikh A.; Pinchuk, Mikhail P.; Pljuschev, Anatoly P.; and Terlo, Vladimir I., to Leningradskoe spelsialnoe konstruktorskoe bjuro polimernogo masinostroenia. Rotary tabletting machine. 4,145,174, Cl. 425-78.000.

Gondo, Hisashi; Takechi, Hiroshi; Abe, Mitsunobu; and Namba, Kazuo, to Nippon Steel Corporation. Process for producing cold rolled steel sheet and strip having improved cold formabilities. 4,145,235, Cl. 148-12.00C.

Gonel-Budantsev, Igor I.: *See—*
Malyshev, Boris N.; Prozorov, Vladimir N.; and Gonel-Budantsev, Igor I., 4,144,888, Cl. 128-303.100.

Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., to United States of America, Navy. Safe high energy density battery. 4,145,484, Cl. 429-105.000.

Goossens, Alfred E.: *See—*
Mookherjee, Braja D.; Withycombe, Donald A.; Katz, Ira; Goossens, Alfred E.; Vock, Manfred H.; Evers, William J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,145,354, Cl. 260-347.200.

Goppold, Otto: *See—*
Sitsen, Heinz; and Goppold, Otto, 4,145,096, Cl. 312-7.0TV.

Gordon, Alan M.: *See—*
Angner, Ronald J.; Egan, Wayne J.; Gordon, Alan M.; and Huryn, William A., 4,145,579, Cl. 179-81.00R.

Gordon, David A.: *See—*
Hall, Luther A. R.; and Gordon, David A., 4,145,510, Cl. 528-72.000.

Gordon, Wolfgang: *See—*
Behme, Klaus J.; Cherdron, Harald; Gordon, Wolfgang; and Burkhardt, Hugo, 4,145,487, Cl. 521-117.000.

Gorin, Everett, to Continental Oil Company. Production of a hydrogen-rich gas from a co-containing fuel gas. 4,145,405, Cl. 423-657.000.

Gorman-Rupp Company, The: *See—*
Wolford, Dale E., 4,145,008, Cl. 241-46.170.

Gosanko, Clarence; and Weinberg, Robert, to National Enquirer Inc. Advertising display device for newspapers and analogous articles. 4,144,661, Cl. 40-10.00D.

Gosudarstvenny Proektno-Izyskatelsky i Nauchno-Issledovatelsky Institut "Aeroproekt": *See—*
Vinogradov, Alexandr P.; Pechersky, Mikhail A.; and Tkachenko, Andrei S., deceased, 4,144,748, Cl. 73-146.000.

Goto, John M.: *See—*
Funke, Maurice F.; and Goto, John M., 4,144,906, Cl. 137-819.000.

Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserruckkuhlanlagen Kommanditgesellschaft: *See—*
Hegemann, Karl R., 4,145,193, Cl. 55-210.000.

Gotz, Hans; Hack, Albert; and Winz, Hans, to Daimler-Benz Aktiengesellschaft. Passenger space ventilation for motor vehicles, especially for passenger motor vehicles. 4,144,803, Cl. 98-2.180.

Gould, Charna; and Gould, William, to Nyltite Corporation of America. Wire guide bushing and method of production. 4,144,616, Cl. 16-2.000.

Gould, William: *See—*
Gould, Charna; and Gould, William, 4,144,616, Cl. 16-2.000.

Gradwell, John; and Daly, William, to Lazarus, Jack. Expanded plastic plant container with break-away bottom. 4,144,672, Cl. 47-73.000.

Grane, Gunnar, to Dynapac Maskin AB. Plate vibrator. 4,145,156, Cl. 404-113.000.

Granof, Herman H.: *See—*
Quast, Danny H.; Fermenich, Dennis R.; and Granof, Herman H., 4,144,673, Cl. 47-57.500.

Grant, R. Peter: *See—*
Leslie, John P.; Lane, Constance A.; and Grant, R. Peter, 4,145,466, Cl. 428-35.000.

Grantham, LeRoy F., to Rockwell International Corporation. Treatment of organic waste. 4,145,396, Cl. 423-22.000.

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Huber, Ernst, 4,145,040, Cl. 271-276.000.
Grewe, Heinz-Gunther; Seeberg, Horst; Fach, Horst; and Isermann, Friedrich, to Didier Engineering GmbH. Discharge apparatus for inclined coke ovens. 4,145,257, Cl. 202-241.000.
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., to Merck & Co., Inc. Anti-microbial piperidino butan-2-ones. 4,145,426, Cl. 424-267.000.
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Grimm, Forrest R., to Minnesota Mining and Manufacturing Company. Thermal switch. 4,145,654, Cl. 337-407.000.
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Stewart, James A., 4,145,572, Cl. 179-2.0BC.
Wisotzky, Otto G.; and Blackburn, Tom L., 4,145,665, Cl. 330-254.000.
GTE Sylvania Incorporated: *See*—
Hand, Wilfred L.; and Brun, Craig W., 4,145,719, Cl. 358-183.000.
Mehalchick, Emil J.; and Kleiner, Richard N., 4,145,224, Cl. 106-73.300.
Phillips, Paul M.; and Donaldson, John G., 4,144,629, Cl. 29-420.500.
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Guif, Stanley E.; Nimmer, Terry L.; Weigt, Donald A.; Wolenec, Glenn; and Gall, Richard C., to Oak Industries Inc. Subscription TV audio carrier recovery system. 4,145,717, Cl. 358-121.000.
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Guillaumin, Jean-Claude, to Societe des Acieries de Paris et D'Outreau. Truck bolster. 4,144,819, Cl. 105-230.000.
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Gupta, Dinesh K.; Dardi, Louis E.; and Freeman, William R., Jr., to Howmet Turbine Components Corporation. Process for producing elevated temperature corrosion resistant metal articles. 4,145,481, Cl. 428-678.000.
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Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Ester derivatives of ether polycarboxylic acids. 4,145,558, Cl. 560-180.000.
Gutshall, Charles E. Long-pitch re-rolled crest thread. 4,144,795, Cl. 85-48.000.
Guzowski, Raymond J., to Pyles Industries, Inc. Apparatus for sealing multi-pane window units. 4,145,171, Cl. 425-110.000.
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Haag, Werner O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Insoluble weak base exchange resin resin-metal compound complex. 4,145,486, Cl. 521-31.000.
Haberle, Fritz; Riechers, Daniel; and Hochrathner, Alfred, to Daimler-Benz Aktiengesellschaft. Bumper covering for motor vehicles. 4,145,077, Cl. 293-102.000.
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Hady, William F.; and Ludwig, Lawrence P., to United States of America, National Aeronautics and Space Administration. Shaft seal assembly for high speed and high pressure applications. 4,145,058, Cl. 277-62.000.
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Hall, Luther A. R.; and Gordon, David A., to Ciba-Geigy Corporation. 5-Substituted phosphonate hydantoins and derivatives thereof. 4,145,510, Cl. 528-72.000.
Hall, Ralph R.; and Shaw, David H., to Exxon Research & Engineering Co. Dilchill dewaxing using wash filtrate solvent dilution. 4,145,275, Cl. 208-33.000.
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Jackson, Gerald D.; Williamson, Jim R.; and Zimmerman, John C., 4,144,937, Cl. 166-314.000.
Hallstrom, Charles A. Tree harvester and transporter. 4,144,918, Cl. 144-3.00D.
Hallstrom, Olof A. Reciprocating conveyor. 4,144,963, Cl. .98-750.000.
Halm Instrument Co., Inc.: *See*—
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Hanni, Manfred, to Siemens Aktiengesellschaft. Radio transmission system for two subscribers to have a mutual connection on one of several frequency channels and having time multiplex interlace of preferred channels. 4,145,657, Cl. 325-32.000.
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Hanson, Douglas R. Pan cleaning apparatus. 4,144,615, Cl. 15-304.000.
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Harris, John F., Jr.; and Sharkey, William H., to Du Pont de Nemours, E. I., and Company. Carboxylated copolymers of isobutylene and a vinylbenzene. 4,145,490, Cl. 526-19.000.
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Harrison, George W., to Team, Inc. Apparatus for closing side openings into pipelines. 4,144,909, Cl. 138-94.000.
Harrison, Henry, to Halm Instrument Co., Inc. Solar energy collector. 4,144,872, Cl. 126-270.000.
Harrison, Richard J.; Muschett, William G.; and Hardy, Charles T., to Safe-T-Lawn, Inc. Guard for pop-up sprinkler. 4,145,003, Cl. 239-288.000.
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Hatanaka, Toru; and Iizuka, Yoshitoku, to Honda Giken Kogyo Kabushiki Kaisha. Orientation of torch openings for prechamber engine. 4,144,848, Cl. 123-32.00L.
Hattori, Kiyoshi; and Mitamura, Takashi, to Fujisawa Pharmaceutical Co., Ltd. Process for isolation and purification of cephalosporin compound. 4,145,539, Cl. 544-20.000.
Haubrich, Lothar; and Durr, Heinrich, to U.S. Philips Corporation. Guide for a printing head of a printing device. 4,145,145, Cl. 400-124.000.
Haugwitz, Rudiger D.; and Cruthers, Larry R., to E. R. Squibb & Sons, Inc. Method of treating helminthiasis by parenteral administration of sulfide- and sulfoxide-derivatives of benzimidazoles. 4,145,431, Cl. 424-273.00B.
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Hayasaka, Kuniyuki; and Tamaoka, Yutaka, to Honny Chemicals Co., Ltd. Simulated leather materials and electrolytic process for making them. 4,145,266, Cl. 204-131.000.
Hayashi, Eiji, to Kabushikikaishi Yokogawa Denki Seisakusho. Electric power to DC signal converter. 4,145,652, Cl. 324-142.000.
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Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, to Ono Pharmaceutical Company. Δ^3-Prostaglandin analogs. 4,145,555, Cl. 560-53.000.
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Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., to Quaker Oats Company, The. Cereal protein fortified food bar. 4,145,448, Cl. 426-72.000.
Hayward, Robert D., to Gilbert Engineering Company, Inc. Surge protector assembly. 4,145,729, Cl. 361-119.000.
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Hedaya, Eddie; Kawakami, James H.; and Kwiatkowski, George T., to Union Carbide Corporation. High temperature carborane-siloxane elastomers intermediate polymeric products and process for preparation. 4,145,504, Cl. 528-5.000.
Hegemann, Karl R., to Gottfried Bischoff Bau Kompl. Gasreinigungsund Wasserruckkuhlanlagen Kommanditgesellschaft. Apparatus for cleaning stack gas and using same for generation of electric power. 4,145,193, Cl. 55-210.000.
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Heller, Harold G. Photochromic compounds. 4,145,536, Cl. 542-441.000.
Hellwarth, Robert W., to University of Southern California. Time-reversed replication of a wave front. 4,145,671, Cl. 332-7.510.
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Andrew, Dennie J.; and Hilton, Avery, Jr., 4,145,564, Cl. 13-18.00A.
Hindman, Milo F. Patio roof. 4,144,691, Cl. 52-461.000.
Hira, Yasuo; Sudo, Ryoichi; Takemoto, Issei; and Isogai, Tokio, to Hitachi, Ltd. Flame-retardant epoxy resin compositions. 4,145,369, Cl. 260-831.000.
Hiraguri, Seisuke: *See—*
Kosaka, Yoshiteru; and Hiraguri, Seisuke, 4,145,642, Cl. 318-331.000.
Hirokichi, Komiya: *See—*
Ohki, Yoshinori; and Hirokichi, Komiya, 4,144,859, Cl. 123-148.0CC.
Hirosawa, Katsu: *See—*
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,145,155, Cl. 404-98.000.
Hirsch, Richard H.; and Selcer, William H., to Monsanto Company. Oxamide stabilizers for organic materials. 4,145,556, Cl. 560-75.000.
Hitachi Denshi Kabushiki Kaisha: *See—*
Otofuji, Kiyoshi, 4,145,662, Cl. 328-181.000.
Hitachi, Ltd.: *See—*
Hira, Yasuo; Sudo, Ryoichi; Takemoto, Issei; and Isogai, Tokio, 4,145,369, Cl. 260-831.000.
Imai, Masaya; and Watanabe, Seiji, 4,145,059, Cl. 277-81.00R.
Katada, Hirosi; Ogasawala, Nobuhiko; and Hashimoto, Hideyuki, 4,144,854, Cl. 123-117.00R.
Kawagoe, Hiroto, 4,145,701, Cl. 357-45.000.
Kojima, Takafumi; Miyoshi, Tatsuru; and Mukaemachi, Takuji, 4,145,577, Cl. 179-18.0HB.
Maeda, Yoshio; and Matsumoto, Koichi, 4,145,643, Cl. 318-696.000.
Maruyama, Koichi; Osakabe, Kuniharu; and Kawanishi, Satoshi, 4,145,677, Cl. 335-212.000.
Miyakawa, Seii; and Takahashi, Naoki, 4,144,639, Cl. 29-809.000.
Omae, Tsutomu; Shibata, Takanori; Sakai, Keiziro; Iizuka, Tomio; and Koyama, Takaichi, 4,144,992, Cl. 228-102.000.
Sakamoto, Masakatsu; Uchida, Kenji; and Honma, Isao, 4,145,087, Cl. 302-14.000.
Seki, Kunio, 4,145,666, Cl. 330-265.000.
Takeuchi, Ryozo; and Igawa, Tatsuo, 4,145,101, Cl. 316-4.000.
Takeuti, Fumihide; Takigawa, Toru; and Takada, Kenichi, 4,145,722, Cl. 358-223.000.
Takikawa, Toru, 4,145,678, Cl. 335-214.000.
Tanaka, Toshio; Nakagawa, Sumio; Miyanaka, Motosi; and Tachi, Seiichi, 4,145,179, Cl. 431-29.000.
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.
Yoshizawa, Shigeru; Sugita, Yutaka; Saito, Nobuo; Arai, Yuji; and Yamaguchi, Nakahiko, 4,145,750, Cl. 365-6.000.
Hitachi Medical Corporation: *See—*
Takami, Katsumi; Ueda, Ken; Kawaguchi, Fumio; Tomura, Teruichi; and Ishimatsu, Kenji, 4,145,609, Cl. 250-361.00R.
HITCO: *See—*
Spain, Raymond G.; and Miller, Albert L., 4,145,472, Cl. 428-367.000.
Hitzman, Donald O., to Phillips Petroleum Company. Process for protein production. 4,145,445, Cl. 426-60.000.
Hiyoshi, Masamitsu: *See—*
Fujishiro, Koretoshi; and Hiyoshi, Masamitsu, 4,145,258, Cl. 202-248.000.
Hobbs, John: *See—*
Eckstein, Fritz; and Hobbs, John, 4,145,531, Cl. 536-26.000.
Hochrathner, Alfred: *See—*
Haberle, Fritz; Riechers, Daniel; and Hochrathner, Alfred, 4,145,077, Cl. 293-102.000.
Hodson, Harold F.; and Batchelor, John F., to Burroughs Wellcome Co. Cyclic sulphur compounds triazolyl substituted phenoxathin 10, 10 dioxides. 4,145,350, Cl. 260-308.00D.
Hoechst Aktiengesellschaft: *See—*
Behme, Klaus J.; Cherdron, Harald; Gordon, Wolfgang; and Burkhardt, Hugo, 4,145,487, Cl. 521-117.000.
Dalibor, Horst, 4,145,513, Cl. 528-75.000.
Fuchs, Hermann; and Filzinger, Klaus, 4,145,339, Cl. 260-148.000.
Holst, Arno; and Lask, Helmut, 4,144,886, Cl. 128-284.000.
Opitz, Konrad; and Uhde, Christa, 4,145,182, Cl. 8-39.00R.
Topp, Alwin; Schmiedel, Klaus; and Schaeffer, Georg, 4,145,283, Cl. 210-63.00R.
von Halasz, Sigmar P.; and Korinth, Jurgen, 4,145,311, Cl. 252-415.000.
von Plessen, Helmold; and Bassler, Edmund, 4,145,393, Cl. 422-7.000.
Hoffmann-La Roche Inc.: *See—*
Dairman, Wallace M.; Felix, Arthur M.; Gallo-Torres, Hugo E.; Heimer, Edgar P.; and Meienhofer, Johannes A., 4,145,337, Cl. 260-112.50S.
Hofmann, Ruediger; and von Basse, Paul-Werner, to Siemens Aktiengesellschaft. Decoder circuit arrangement with MOS transistors. 4,145,622, Cl. 307-270.000.
Hogenhout, Franciscus, to Boeing Company, The. Sealant applicator apparatus for automatic riveting machines and the like. 4,144,625, Cl. 29-34.00B.
Hokanson, James S.: *See—*
Gatti, Anthony R.; Hokanson, James S.; and Nozaki, Kenzie, 4,145,297, Cl. 252-25.000.
Hollo, Janos: *See—*
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.
Holloway, Nicholas H.: *See—*
White, Derek G. W.; Holloway, Nicholas H.; and Attwood, Brian W., 4,144,619, Cl. 19-304.000.
Holm, Robert E., to Diamond Shamrock Corporation. Multicomponent fruit abscission compositions. 4,145,209, Cl. 71-92.000.
Holst, Arno; and Lask, Helmut, to Hoechst Aktiengesellschaft. Absorbent laminate. 4,144,886, Cl. 128-284.000.
Holzmann, Hermann, to U. I. Lapp K.G. Clamping device for cables, leads, hoses or the like. 4,145,075, Cl. 285-81.000.
Homan, Gary R.; and Toporcer, Louis H., to Dow Corning Corporation. Short chain linear amidosiloxanes. 4,145,359, Cl. 260-448.20N.
Honda, Eiichi, to Sumitomo Metal Industries, Ltd. Die forging press. 4,144,736, Cl. 72-404.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Asaka, Urataro; and Ohara, Hitoshi, 4,144,850, Cl. 123-52.00M.
Hatanaka, Toru; and Iizuka, Yoshitoku, 4,144,848, Cl. 123-32.00L.
Honda, Norimasa: *See—*
Sako, Junichi; Honda, Norimasa; Tokunaga, Hideo; Hoshino, Toshiro; and Kai, Shin-ichiro, 4,145,385, Cl. 264-22.000.
Honda, Shunsuke: *See—*
Yahata, Haruki; Honda, Shunsuke; and Kawasaki, Tadamichi, 4,145,663, Cl. 329-50.000.
Honeywell Inc.: *See—*
Aske, Vernon H., 4,144,765, Cl. 73-517.00B.
Ballinger, Dale O., 4,145,697, Cl. 346-35.000.
Yokoyama, Akira, 4,144,751, Cl. 73-194.0EM.
Honick, Cecil W. Pipe wrench. 4,144,779, Cl. 81-103.000.
Honjo, Satoru: *See—*
Iwasa, Masakazu; Matsumoto, Seiji; Honjo, Satoru; and Iida, Teruo, 4,144,808, Cl. 101-1.000.
Honma, Isao: *See—*
Sakamoto, Masakatsu; Uchida, Kenji; and Honma, Isao, 4,145,087, Cl. 302-14.000.
Honnert, Quentin E.: *See—*
Stapp, Willis J.; and Honnert, Quentin E., 4,144,694, Cl. 53-52.000.
Honny Chemicals Co., Ltd.: *See—*
Hayasaka, Kuniyuki; and Tamaoka, Yutaka, 4,145,266, Cl. 204-131.000.
Horii, Hideo: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,145,501, Cl. 526-217.000.
Horlacher, Walter R., Jr.; and Owens, Jack L., to Monsanto Company. Cylindrical fiber bed separator element with side-entry inlet duct to core of element. 4,145,194, Cl. 55-242.000.
Horsfall, Harry: *See—*
Withers, John A.; Hull, Charles H.; and Horsfall, Harry, 4,144,947, Cl. 180-132.000.
Horster, Horst: *See—*
Bruno, Richard; Hermann, Wilhelm; Horster, Horst; Kersten, Reinhard; Klinkenberg, Klaus; Mahdjuri, Faramarz; and Bannigan, John, 4,144,875, Cl. 126-271.000.
Hosaka, Akio, to Nissan Motor Company, Limited. Emission control apparatus for internal engines with means for generating step function voltage compensating signals. 4,144,847, Cl. 123-32.0EE.

Hoshino, Toshiro: *See—*
Sako, Junichi; Honda, Norimasa; Tokunaga, Hideo; Hoshino, Toshiro; and Kai, Shin-ichiro, 4,145,385, Cl. 264-22.000.
Hostetler, Van B.: *See—*
McKnight, Hugh P.; and Hostetler, Van B., 4,144,970, Cl. 209-542.000.
Houdaille Industries, Inc.: *See—*
Troyer, William J., 4,144,630, Cl. 29-436.000.
von Langendorff, Vitmar G., 4,144,785, Cl. 83-685.000.
Howard Machinery Limited: *See—*
Randall, Bryce, 4,145,383, Cl. 261-29.000.
Howmet Turbine Components Corporation: *See—*
Gupta, Dinesh K.; Dardi, Louis E.; and Freeman, William R., Jr., 4,145,481, Cl. 428-678.000.
Hu, Evelyn L.; and Jackel, Lawrence D., to Bell Telephone Laboratories, Incorporated. Superconducting junctions utilizing a binary semiconductor barrier. 4,145,699, Cl. 357-5.000.
Huber, Ernst, to Gretag Aktiengesellschaft. Gripper drum. 4,145,040, Cl. 271-276.000.
Hughes Aircraft Company: *See—*
Mastrup, Frithjof N.; and Wang, John H. S., 4,145,668, Cl. 331-94.50P.
Hughes, Charles C., to R. A. Jones & Co. Inc. Apparatus for folding and gluing carton blanks. 4,144,800, Cl. 93-49.00R.
Hughes, Geoffrey W.: *See—*
Rokop, Joseph; and Hughes, Geoffrey W., 4,144,928, Cl. 164-418.000.
Hughes, Howard C., Jr.: *See—*
Tyers, G. Frank O.; Hughes, Howard C., Jr.; and Gwirtz, Kenneth, 4,144,889, Cl. 128-418.000.
Hughes Tool Company: *See—*
Dyer, Billy F., 4,145,034, Cl. 267-125.000.
Hull, Charles H.: *See—*
Withers, John A.; Hull, Charles H.; and Horsfall, Harry, 4,144,947, Cl. 180-132.000.
Hultgren, K. Sten R.: *See—*
Berge, Sven E.; and Hultgren, K. Sten R., 4,144,797, Cl. 89-41.00M.
Hundstad, Richard L.: *See—*
Babcock, Richard V.; Pack, John L.; and Hundstad, Richard L., 4,145,669, Cl. 331-94.5PE.
Hunt, Eric, to Beecham Group Limited. Beta-lactam compounds, preparation and use. 4,145,430, Cl. 424-272.000.
Hunt Manufacturing Co.: *See—*
Alexander, Robert L., 4,145,098, Cl. 312-257.0SM.
Hurt, David B.: *See—*
Lamb, Sydney M.; and Hurt, David B., 4,145,737, Cl. 364-200.000.
Huryn, William A.: *See—*
Angner, Ronald J.; Egan, Wayne J.; Gordon, Alan M.; and Huryn, William A., 4,145,579, Cl. 179-81.00R.
Husqvarna AB: *See—*
Landen, Gote G. V., 4,144,770, Cl. 74-47.000.
Huston, Charles W. Brick alignment pole. 4,144,649, Cl. 33-85.000.
I. S. Engineering Co., Ltd.: *See—*
Doi, Shigemitsu, 4,145,636, Cl. 315-101.000.
Ichikawa, Yataro; and Yamaji, Teizo, to Teijin Limited. Process for isomerizing one of the geometric isomers of an α,β-unsaturated aldehyde to its corresponding other geometric isomer. 4,145,366, Cl. 260-601.00R.
Ichiyanagi, Takashi; Akiyama, Takashige; and Otoda, Ichizo, to Matsushita Electric Industrial Co., Ltd. Coating apparatus. 4,144,838, Cl. 118-125.000.
ICI Americas Inc.: *See—*
Kuehn, Erich, 4,145,544, Cl. 544-222.000.
Ida, Hisashi: *See—*
Murakami, Masuo; Takahashi, Kozo; Murase, Kiyoshi; Mase, Toshiyasu; Ida, Hisashi; and Takenaka, Toichi, 4,145,363, Cl. 260-553.00A.
Ide, Allan R. Adjustable attitude loading trimmer. 4,144,962, Cl. 198-641.000.
IDR Enterprises, Inc.: *See—*
Krizik, Jan G., 4,145,004, Cl. 239-499.000.
Igawa, Tatsuo: *See—*
Takeuchi, Ryozo; and Igawa, Tatsuo, 4,145,101, Cl. 316-4.000.
Ihle, Josef, to Irma Ungerer geb. Dollinger. Machine for flattening sheet metal. 4,144,731, Cl. 72-165.000.
Iida Denki Kogyo K.K.: *See—*
Ohki, Yoshinori; and Hirokichi, Komiya, 4,144,859, Cl. 123-148.0CC.
Iida, Takao; Shirahata, Kunikatsu; Maisubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, to Abbott Laboratories. Process for producing fortimicin factors. 4,145,253, Cl. 195-96.000.
Iida, Teruo: *See—*
Iwasa, Masakazu; Matsumoto, Seiji; Honjo, Satoru; and Iida, Teruo, 4,144,808, Cl. 101-1.000.
Iinuma, Yoshio, to Citizen Watch Co. Ltd. Timepiece circuit device. 4,144,705, Cl. 58-52.00R.
Iio, Katsuro; and Osato, Akiyoshi, to Kobe Steel, Limited. Automatic arc welding process using a consumable nozzle. 4,145,598, Cl. 219-137.00R.
IIT Research Institute: *See—*
Bridges, Jack; and Taflove, Allen, 4,144,935, Cl. 166-248.000.
Iizuka, Haruhiko: *See—*
Kato, Fumiaki; Iizuka, Haruhiko; and Matsumoto, Junichiro, 4,144,864, Cl. 123-198.00F.
Iizuka, Tomio: *See—*
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Iizuka, Yoshitoku: *See—*
Hatanaka, Toru; and Iizuka, Yoshitoku, 4,144,848, Cl. 123-32.00L.
Ikeda, Yoshitsugi, to Olympus Optical Co., Ltd. Large aperture ultra wide angle photographic lens system. 4,145,116, Cl. 350-214.000.
Ikeda, Yoshitsugi, to Olympus Optical Co., Ltd. Retrofocus type wide angle lens system. 4,145,117, Cl. 350-214.000.
Imai, Masaya; and Watanabe, Seiji, to Hitachi, Ltd. Mechanical seal. 4,145,059, Cl. 277-81.00R.
Imperial Chemical Industries Limited: *See—*
Adsetts, John R., 4,145,400, Cl. 423-419.00P.
Aldridge, David C.; Crawley, Graham C.; and Strawson, Colin J., 4,145,437, Cl. 424-279.000.
Crosby, John; and Milner, John A., 4,145,360, Cl. 260-453.00P.
Ridyard, Denis R. A., 4,145,340, Cl. 260-153.000.
Inaba, Mitugu: *See—*
Kasahara, Masao; Kouguchi, Noriyuki; Inaba, Mitugu; Kagawa, Masao; Yamada, Kunio; and Tanida, Hiroshi, 4,144,961, Cl. 198-472.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Farina, Attilio, 4,145,685, Cl. 340-782.000.
Industrial Metal Products Corporation: *See—*
Judge, Edward E., Jr., 4,144,730, Cl. 72-12.000.
Industrie Pirelli S.p.A.: *See—*
Bottasso, Franco; and Colombani, Bruno, 4,145,238, Cl. 156-132.000.
Ingham, Robert M., Jr., to Milliken Research Corporation. Open end spun slub yarn. 4,144,703, Cl. 57-58.890.
Ingraham, Glen E., to Colorguard Corporation. Grounded fence fabric. 4,145,030, Cl. 256-1.000.
Inoue, Koichi; Nonogaki, Hajime; Urakawa, Tatsuo; and Shimizu, Kazuyuki, to Fujitsu Limited. Plural virtual address space processing system. 4,145,738, Cl. 364-200.000.
Institut Fiziki Akademii Nauk Latviiskoi SSR: *See—*
Ioffe, Benyamin A.; Zommer, Jury A.; Kalnin, Robert K.; and Kanaev, Alexandr S., 4,144,637, Cl. 29-739.000.
Institut Francais du Petrole: *See—*
Alagy, Jacques; and Dang Vu, Quang, 4,145,560, Cl. 562-412.000.
Chatard, Michel; Pignard, Guy; and Thiery, Jean, 4,145,014, Cl. 242-83.000.
Cosyns, Jean; and Franck, Jean-Pierre, 4,145,276, Cl. 208-57.000.
Institut Gornogo Dela Imeni A.A. Skochinskogo: *See—*
Sidorovich, Vladimir G.; Dokukin, Alexandr V.; Shmarian, Evgeny M.; Kazakov, Vladimir V.; and Lepikhov, Alexandr I., 4,145,744, Cl. 364-554.000.
Institutul de Cercetari in Constructii Si Economia Constructiilor: *See—*
Moraru, Dinu-Stefan, 4,145,270, Cl. 204-180.00R.
International Business Machines Corporation: *See—*
Beaudouin, Pierre L.; and Debord, Pierre, 4,145,721, Cl. 358-213.000.
Burkhardt, Paul J.; and Poponiak, Michael R., 4,144,636, Cl. 29-590.000.
Edwards, Earl G.; and Peterson, Charles E., 4,145,181, Cl. 432-60.000.
Jambotkar, Chakrapani G., 4,145,700, Cl. 357-23.000.
Wallis, Christopher N., 4,145,725, Cl. 360-106.000.
International Flavors & Fragrances Inc.: *See—*
Mookherjee, Braja D.; Withycombe, Donald A.; Katz, Ira; Goossens, Alfred E.; Vock, Manfred H.; Evers, William J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,145,354, Cl. 260-347.200.
International Minerals & Chemical Corp.: *See—*
Snow, Robert E., 4,144,969, Cl. 209-166.000.
Interx Research Corporation: *See—*
Bodor, Nicholas S., 4,145,441, Cl. 424-309.000.
in't Veld, Cornelis, to National Marine Service Incorporated. Surface skimmer. 4,145,292, Cl. 210-242.00R.
Inui, Tsuneo: *See—*
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Inventa AG fur Forschung und Patentverwertung, Zurich: *See—*
Suhner, Werner, 4,145,521, Cl. 528-323.000.
Ioffe, Benyamin A.; Zommer, Jury A.; Kalnin, Robert K.; and Kanaev, Alexandr S., to Institut Fiziki Akademii Nauk Latviiskoi SSR. Device for making sets of nonmagnetic current-conducting components. 4,144,637, Cl. 29-739.000.
Iogansen, Vadim I.: *See—*
Aroshidze, Jury V.; Iogansen, Vadim I.; Kadi-ogly, Ibragim A.; Petrov, Jury V.; Ptakul, Izrail A.; Romanov, Vasily V.; Sudarikov, Vasily L.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; and Shkoda, Gennady V., 4,145,626, Cl. 310-91.000.
Iribe, Seiki: *See—*
Nosse, Yoshinori; Ono, Tomoyoshi; Suzuki, Hideaki; Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,145,271, Cl. 204-180.00P.
Irma Ungerer geb. Dollinger: *See—*
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Isermann, Friedrich: *See—*
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Ishiba, Jintaro, to Yoshida Kogyo K.K. Indirect extrusion process and apparatus. 4,144,734, Cl. 72-253.00A.
Ishida, Masato: *See—*
Sakurai, Masaaki; and Ishida, Masato, 4,145,599, Cl. 219-216.000.

Ishigaki, Masahiro: *See*—
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Ishihara, Ken: *See*—
Yabuta, Keiichiro; Marumo, Nagayuki; Shimabara, Yoichi; Ishigaki, Masahiro; Ishihara, Ken; and Mayama, Yoshiki, 4,144,921, Cl. 152-353.00R.

Ishihara, Masamitsu. Method and machine for digging ditch. 4,145,086, Cl. 299-15.000.

Ishii, Shinzo: *See*—
Iida, Takao; Shirahata, Kunikatsu; Maisubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,145,253, Cl. 195-96.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Nakata, Jyoichi; Chiba, Yasumasa; Seto, Tetsuhiko; and Fukuhara, Yoshinori, 4,145,265, Cl. 204-98.000.

Ishimatsu, Kenji: *See*—
Takami, Katsumi; Ueda, Ken; Kawaguchi, Fumio; Tomura, Teruichi; and Ishimatsu, Kenji, 4,145,609, Cl. 250-361.00R.

Ishizawa, Tadao, to Kabushiki Kaisha Daini Seikosha. Crimped seal piezoelectric resonator package. 4,145,627, Cl. 310-344.000.

Isogai, Tokio: *See*—
Hira, Yasuo; Sudo, Ryoichi; Takemoto, Issei; and Isogai, Tokio, 4,145,369, Cl. 260-831.000.

Itaya, Hideo, to Olympus Optical Co., Ltd. Photo eyepiece for microscopes. 4,145,108, Cl. 350-175.00E.

Ito, Tadashi: *See*—
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Murakami, Hiroyasu; and Ito, Tadashi, 4,145,129, Cl. 354-23.00D.

Iura, Yukio: *See*—
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Ivy, John B.: *See*—
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Iwai, Sakuya: *See*—
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Iwasa, Masakazu; Matsumoto, Seiji; Honjo, Satoru; and Iida, Teruo, to Fuji Photo Film Co., Ltd. Electrophotographic marking apparatus. 4,144,808, Cl. 101-1.000.

Iwasaki, Kenji, to Tokyo Shibaura Electric Co., Ltd. Rotating anode X-ray tube. 4,145,628, Cl. 313-60.000.

Iwasaki, Sadayoshi, to Alps Electric Co., Ltd. Rotary pulse switch. 4,145,585, Cl. 200-11.0DA.

Iwata, Koichi, to Sumitomo Electric Industries, Ltd. Frictional material for brakes. 4,145,223, Cl. 106-36.000.

Izon Corporation: *See*—
Yevick, George J., 4,145,131, Cl. 354-115.000.

Izraeli, Hyman, to Thomas & Betts Corporation. Adjusting mechanism for a tool. 4,144,737, Cl. 72-409.000.

J. R. Schneider Company: *See*—
Crowe, William D., 4,145,288, Cl. 210-111.000.

Jablanofsky, Charles C.: *See*—
Auchinleck, Richard J.; Schisselbauer, John C.; Garczynski, John S.; Jablanofsky, Charles C.; and Dobson, Charles J., 4,145,606, Cl. 235-477.000.

Jablecki, Elizabeth S.: *See*—
Wilbur, Milton S., 4,145,294, Cl. 210-419.000.

Jackel, Lawrence D.: *See*—
Hu, Evelyn L.; and Jackel, Lawrence D., 4,145,699, Cl. 357-5.000.

Jackson, Alexander, III: *See*—
Allen, Richard W.; and Jackson, Alexander, III, 4,145,660, Cl. 328-138.000.

Jackson, Gerald D.; Williamson, Jim R.; and Zimmerman, John C., to Halliburton Company. Valve closing method and apparatus for use with an oil well valve. 4,144,937, Cl. 166-314.000.

Jackson, Winston J., Jr.: *See*—
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,145,518, Cl. 528-272.000.

Jaekle, William M.; Byrne, Robert; and Giovanelli, Armand, to Southern Pacific Transportation Company. Rail car closure. 4,144,820, Cl. 105-368.00R.

Jambotkar, Chakrapani G., to International Business Machines Corporation. Power field effect transistors. 4,145,700, Cl. 357-23.000.

James, Rex J.: *See*—
Olander, Emil E., Jr.; James, Rex J.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,752, Cl. 364-709.000.

James, Rex L.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,742, Cl. 364-709.000.

Jan, Gerald; Hagen, Remon; and Lenoir, John, to Ciba-Geigy AG. Quinoxalines and their use in photographic processes. 4,145,217, Cl. 96-53.000.

Janssen, Harald: *See*—
Kertscher, Eberhard; and Janssen, Harald, 4,145,474, Cl. 428-379.000.

Janssen, Robert L.; and Bucholz, Lee M. Golfing iron with weight adjustment. 4,145,052, Cl. 273-171.000.

Jarque, Ricardo G.; Domingo, Mercedes A.; Cartes, Juan Bosch; Roldan, Cristobal M.; and Peinado, Fernando R., to Laboratorios Made, S.A. 1,4,4a-Trimethyl-1,2,4a,-4b,9a,10a-hexahydro-10H-benzo [b] thieno [2',3':4,3]cyclopent-[1,2-b]-pyridine. 4,145,424, Cl. 424-256.000.

Jeanmart, Claude: *See*—
Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,145,423, Cl. 424-251.000.

Jendersee, Melvin H.: *See*—
Brackin, John F.; and Jendersee, Melvin H., 4,144,772, Cl. 74-242.15R.

Jered Industries, Inc.: *See*—
Gregory, Charles E.; Brian, Michael; Thomas, Jerald F.; and Cameron, James F., 4,144,903, Cl. 137-624.110.

Jetzer, Raimund, to Gewerbebank Baden Aktiengesellschaft. Method and apparatus for processing waste materials. 4,145,007, Cl. 241-24.000.

Johns, Allen R. Clevis and mounting anchor for a pulley. 4,145,029, Cl. 254-188.000.

Johnson, Alexander L.: *See*—
Burns, Richard C.; and Johnson, Alexander L., 4,145,527, Cl. 536-4.000.

Johnson, Earl R.; and Watkins, Lesley G., to Loffland Brothers Company. Rotary drive disc brake for drawworks. 4,144,953, Cl. 188-134.000.

Johnson & Johnson: *See*—
Milnamow, John P., 4,144,887, Cl. 128-287.000.

Johnson, Kenneth C., to F. J. Littell Machine Company. High speed cam roll lifter for press feeder. 4,144,990, Cl. 226-154.000.

Johnston, Edward, to Carrier Drysys Limited. Coating apparatus. 4,144,837, Cl. 118-7.000.

Johren, Paul: *See*—
Stecher, Friedhelm; Morsbach, Martin; and Johren, Paul, 4,145,060, Cl. 277-139.000.

Jonas, Gerald L. Building unit. 4,144,692, Cl. 52-637.000.

Jones, David G. Omnidirectional clock. 4,144,708, Cl. 58-126.00R.

Jones, Frank W., to Redco, Inc. Safety guard for manual food slicer. 4,144,784, Cl. 83-425.300.

Jones, Howard; and Frankshun, Robert A., to Merck & Co., Inc. Preparation of 3β-hydroxy-27-norcholest-5-ene-25-one and intermediates thereof. 4,145,346, Cl. 260-239.55C.

Jones & Laughlin Steel Corporation: *See*—
Roney, John E., 4,144,758, Cl. 73-355.00R.

Jones, Reuben G.; and Terando, Norman H., to Eli Lilly and Company. 3-Nitropyrazole derivatives. 4,145,554, Cl. 548-377.000.

Jones, Robert K.: *See*—
Sefick, Stephen A.; and Jones, Robert K., 4,145,233, Cl. 148-1.500.

Jones, Ronald. Soccer training apparatus. 4,145,046, Cl. 273-55.00B.

Joy, Walter S. Granular material dispenser. 4,144,989, Cl. 222-438.000.

Judge, Edward E., Jr., to Industrial Metal Products Corporation. Production workpiece straightening system. 4,144,730, Cl. 72-12.000.

Juhasz, Balazs: *See*—
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.

Julian, Anthony P., to Strachan & Henshaw Limited. Printing sleeves. 4,144,812, Cl. 101-382.00R.

Julian, Anthony P., to Strachan & Henshaw Limited. Printing sleeves. 4,144,813, Cl. 101-382.00R.

Juneau, Paul W., Jr.; and West, Martin M., to General Electric Company. Bimetallic adhesive mixture for bonding and release applications. 4,145,328, Cl. 260-30.40R.

Justice, Orien N., to Camact Pump Corp. Displacement pump. 4,145,166, Cl. 417-519.000.

JWI Ltd.: *See*—
Hansen, Victor E., 4,145,249, Cl. 162-210.000.

K. T. Manufacturing Co., Ltd.: *See*—
Takahashi, Hiroshi; Muto, Yasutami; Suzuki, Hiroshi; and Fukuda, Shiro, 4,144,675, Cl. 51-76.00R.

Kabell, Louis J.: *See*—
Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., 4,145,702, Cl. 357-45.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Ishizawa, Tadao, 4,145,627, Cl. 310-344.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,145,155, Cl. 404-98.000.

Kabushiki Kaisha Sato: *See*—
Sato, Yo, 4,144,809, Cl. 101-288.000.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,144,810, Cl. 101-292.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Kubota, Kanemitsu, 4,145,120, Cl. 350-332.000.

Kabushikikaishi Yokogawa Denki Seisakusho: *See*—
Hayashi, Eiji, 4,145,652, Cl. 324-142.000.

Kadi-ogly, Ibragim A.: *See*—
Aroshidze, Jury V.; Iogansen, Vadim I.; Kadi-ogly, Ibragim A.; Petrov, Jury V.; Ptakul, Izrail A.; Romanov, Vasily V.; Sudarikov, Vasily L.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; and Shkoda, Gennady V., 4,145,626, Cl. 310-91.000.

Kadota, Kenji: *See*—
Kato, Kazumasa; and Kadota, Kenji, 4,145,210, Cl. 75-3.000.

Kagawa, Masao: *See*—
Kasahara, Masao; Kouguchi, Noriyuki; Inaba, Mitugu; Kagawa, Masao; Yamada, Kunio; and Tanida, Hiroshi, 4,144,961, Cl. 198-472.000.

Kai, Shin-ichiro: *See—*
Sako, Junichi; Honda, Norimasa; Tokunaga, Hideo; Hoshino, Toshiro; and Kai, Shin-ichiro, 4,145,385, Cl. 264-22.000.

Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, to Nippon Oil Co., Ltd. Water-soluble coating composition. 4,145,501, Cl. 526-217.000.

Kajitsuka, Syoji: *See—*
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.

Kajiyama, Kenji: *See—*
Hata, Susumu; Kajiyama, Kenji; and Mizushima, Yoshihiko, 4,145,121, Cl. 350-355.000.

Kaken Chemical Co., Ltd.: *See—*
Hamazaki, Yasuhiko; Kawabata, Shozo; Yamamoto, Toshiyuki; Shiraishi, Yasuo; and Ueno, Akira, 4,145,444, Cl. 424-331.000.

Kakuta, Hiroshi: *See—*
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,145,155, Cl. 404-98.000.

Kakuta, Katsuyo: *See—*
Muranaka, Shigeo; Takagi, Yasuo; Araki, Yasushi; and Kakuta, Katsuyo, 4,144,860, Cl. 123-148.00C.

Kallay, Victor: *See—*
Szego, Andrew; and Kallay, Victor, 4,144,624, Cl. 29-6.100.

Kallenberger, Robert H.: *See—*
Anderson, John E.; and Kallenberger, Robert H., 4,144,997, Cl. 236-15.0BF.

Kalnin, Robert K.: *See—*
Ioffe, Benyamin A.; Zommer, Jury A.; Kalnin, Robert K.; and Kanaev, Alexandr S., 4,144,637, Cl. 29-739.000.

Kaltenberg, Hans-Georg: *See—*
Kampf, Fritz; and Kaltenberg, Hans-Georg, 4,144,934, Cl. 165-134.00R.

Kaluza, Hans J.: *See—*
Feltgen, Karlheinz; Kaluza, Hans J.; Muschelknautz, Edgar; and Simon, Hans J., 4,145,520, Cl. 528-323.000.

Kaminishi, Masashi: *See—*
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,145,155, Cl. 404-98.000.

Kampf, Fritz; and Kaltenberg, Hans-Georg, to Vereinigte Aluminium-Werke A.G. Arrangement for changing the temperature of fluids which form incrustations. 4,144,934, Cl. 165-134.00R.

Kanaev, Alexandr S.: *See—*
Ioffe, Benyamin A.; Zommer, Jury A.; Kalnin, Robert K.; and Kanaev, Alexandr S., 4,144,637, Cl. 29-739.000.

Kaneda, Isao, to NEC Sylvania Corporation. Discharge lamp lighting system using series connected starters. 4,145,638, Cl. 315-323.000.

Kaneko, Chikara: *See—*
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,145,357, Cl. 260-397.200.

Kano Denki Kabushiki Kaisha: *See—*
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,144,646, Cl. 32-40.00R.

Kantor, Frederick W. Rotary thermodynamic apparatus. 4,144,721, Cl. 62-298.000.

Kanzler, Wolfgang: *See—*
Bromer, Gunter; and Kanzler, Wolfgang, 4,144,780, Cl. 83-71.000.

Karl Kroyer St. Anne's Limited: *See—*
White, Derek G. W.; Holloway, Nicholas H.; and Attwood, Brian W., 4,144,619, Cl. 19-304.000.

Karling, Krister: *See—*
Hansson, Hans; and Karling, Krister, 4,145,111, Cl. 350-97.000.

Karpov, Vladimir A.: *See—*
Rabinovich, Volf I.; Kriger, Jury N.; Sapozhnikov, Alexandr I.; Svitenko, Igor A.; Sapunov, Viktor E.; Filippov, Vyacheslav V.; and Karpov, Vladimir A., 4,145,563, Cl. 13-9.0ES.

Kasahara, Masao; Kouguchi, Noriyuki; Inaba, Mitugu; Kagawa, Masao; Yamada, Kunio; and Tanida, Hiroshi, to Toray Industries, Inc. Method and apparatus for transporting a group of yarn packages. 4,144,961, Cl. 198-472.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Comparing apparatus for variable length word. 4,145,753, Cl. 364-900.000.

Kashiwabara, Hoichiro: *See—*
Teshima, Toru; Kashiwabara, Hoichiro; and Uchiyama, Yoshinori, 4,144,635, Cl. 29-572.000.

Kasin, Hans, to Gravbergskovens Aktieselskab. Flexible track for vehicles. 4,145,092, Cl. 305-35.0EB.

Kasten, Nelson H.: *See—*
Fox, Thomas U.; and Kasten, Nelson H., 4,145,296, Cl. 252-8.100.

Kaszynski, Edwin: *See—*
Usdin, Vera R.; and Kaszynski, Edwin, 4,145,413, Cl. 424-63.000.

Katada, Hirosi; Ogasawala, Nobuhiko; and Hashimoto, Hideyuki, to Hitachi, Ltd. Ignition apparatus for internal combustion engine. 4,144,854, Cl. 123-117.00R.

Kato, Fumiaki; Iizuka, Haruhiko; and Matsumoto, Junichiro, to Nissan Motor Company, Limited. Method and apparatus for disabling cylinders under light load conditions by comparison with variable reference. 4,144,864, Cl. 123-198.00F.

Kato, Kazumasa; and Kadota, Kenji, to Sumitomo Metal Industries, Ltd.; and Sumitomo Heavy Industries, Ltd. Process for indurating dried pellets in a rotary kiln. 4,145,210, Cl. 75-3.000.

Kato, Takeshi; Tanaka, Akira; Hayashi, Jun; and Mikawa, Akikazu, to Fuji Photo Film Co., Ltd. Multilayer color sensitive materials. 4,145,219, Cl. 96-74.000.

Katz, Carlos: *See—*
Bahder, George; Eager, George S., Jr.; and Katz, Carlos, 4,145,567, Cl. 174-107.000.

Katz, Ira: *See—*
Mookherjee, Braja D.; Withycombe, Donald A.; Katz, Ira; Goossens, Alfred E.; Vock, Manfred H.; Evers, William J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,145,354, Cl. 260-347.200.

Kauffman, Ivan L.: *See—*
Neumayer, Jack M.; and Kauffman, Ivan L., 4,145,236, Cl. 156-73.100.

Kaule, Walter; and Primbsch, Erik, to Krautkramer-Branson, Inc. Method and apparatus for producing pulse-shaped acoustic waves on a workpiece surface. 4,144,767, Cl. 73-643.000.

Kawabata, Shozo: *See—*
Hamazaki, Yasuhiko; Kawabata, Shozo; Yamamoto, Toshiyuki; Shiraishi, Yasuo; and Ueno, Akira, 4,145,444, Cl. 424-331.000.

Kawagoe, Hiroto, to Hitachi, Ltd. Semiconductor device. 4,145,701, Cl. 357-45.000.

Kawaguchi, Fumio: *See—*
Takami, Katsumi; Ueda, Ken; Kawaguchi, Fumio; Tomura, Teruichi; and Ishimatsu, Kenji, 4,145,609, Cl. 250-361.00R.

Kawai Musical Instrument Mfg. Co. Ltd.: *See—*
Deutsch, Ralph, 4,144,789, Cl. 84-1.240.

Kawai, Noriaki; and Yamamoto, Heisuke, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of controlling a throttle valve and a throttle valve opening control device. 4,144,852, Cl. 123-97.00B.

Kawakami, James H.: *See—*
Hedaya, Eddie; Kawakami, James H.; and Kwiatkowski, George T., 4,145,504, Cl. 528-5.000.

Kawakami, Shoichi: *See—*
Hayashi, Takao; and Kawakami, Shoichi, 4,145,382, Cl. 260-987.000.

Kawamura, Hiroaki: *See—*
Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, 4,145,263, Cl. 204-35.00R.

Kawamura, Kazuo: *See—*
Mizoguchi, Takahisa; Henmi, Hiroshi; Shima, Tsukasa; Yamashita, Yasuhiko; Uematsu, Shinichi; and Kawamura, Kazuo, 4,145,468, Cl. 428-239.000.

Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Murakami, Hiroyasu; and Ito, Tadashi, to Canon Kabushiki Kaisha. Photographic information display apparatus for camera. 4,145,129, Cl. 354-23.00D.

Kawanishi, Satoshi: *See—*
Maruyama, Koichi; Osakabe, Kuniharu; and Kawanishi, Satoshi, 4,145,677, Cl. 335-212.000.

Kawasaki, Tadamichi: *See—*
Yahata, Haruki; Honda, Shunsuke; and Kawasaki, Tadamichi, 4,145,663, Cl. 329-50.000.

Kaye, Peter D.: *See—*
Medding, Reuben; and Kaye, Peter D., 4,145,724, Cl. 360-92.000.

Kays, Sandra E. Flexible-walled demountable greenhouse. 4,144,899, Cl. 135-1.00R.

Kazakov, Vladimir V.: *See—*
Sidorovich, Vladimir G.; Dokukin, Alexandr V.; Shmarian, Evgeny M.; Kazakov, Vladimir V.; and Lepikhov, Alexandr I., 4,145,744, Cl. 364-554.000.

Kazaoka, Manabu: *See—*
Morishita, Teru; and Kazaoka, Manabu, 4,144,710, Cl. 60-39.360.

Keller, Erich: *See—*
Keller, Klaus; and Keller, Erich, 4,145,595, Cl. 219-75.000.

Keller, Klaus; and Keller, Erich, to Welding Nozzle Incorporated. Gas shielded arc-welding torch. 4,145,595, Cl. 219-75.000.

Kelley, Omer J.; and Harper, Judson M., to KOFK, Inc. Portable power winch assembly. 4,145,028, Cl. 254-186.00R.

Kelly, Michael J. Automatic localized micro-contrast control for photographic printing systems. 4,145,709, Cl. 358-6.000.

Kelly, Robert C.; and Wechter, William J., to Upjohn Company, The. Organic compounds and compositions of ara-cytidine. 4,145,414, Cl. 424-180.000.

Kelly, Thomas L. Free form building construction. 4,144,680, Cl. 52-80.000.

Keltrol Enterprises, Inc.: *See—*
Groff, James; and Driscoll, Stanley, 4,145,175, Cl. 425-377.000.

Kemper, Yves J.; and Pouliot, Harvey N., to Vadetec Corporation. Variable stroke piston type engine. 4,144,771, Cl. 74-60.000.

Kendall, Clarence E., Jr.: *See—*
Moore, Boyd B.; and Kendall, Clarence E., Jr., 4,144,610, Cl. 15-159.00A.

Kendall, Ernest G.; and Pepper, Roger T., to Fiber Materials, Inc. Reinforced metal matrix composite. 4,145,471, Cl. 428-366.000.

Kendall, Robert B.: *See—*
Dziura, Walter H.; and Kendall, Robert B., 4,144,738, Cl. 72-410.000.

Kercso, Joseph E.: *See—*
Bliss, George D.; Kercso, Joseph E.; and McGuire, Richard J., 4,144,841, Cl. 119-5.000.

Kerr, Robert N., Jr.: *See—*
Dolch, Ronald G.; and Kerr, Robert N., Jr., 4,145,327, Cl. 260-29.6MN.

Kersten, Ralf, to Siemens Aktiengesellschaft. Method for the production of optical directional couplers. 4,145,457, Cl. 427-38.000.

Kersten, Reinhard: *See—*
Bruno, Richard; Hermann, Wilhelm; Horster, Horst; Kersten, Reinhard; Klinkenberg, Klaus; Mahdjuri, Faramarz; and Bannigan, John, 4,144,875, Cl. 126-271.000.

Kertscher, Eberhard; and Janssen, Harald, to Maillefer S.A.; and Dr. Beck & Co. AG. Method of manufacturing insulated electric wire of the enamelled-wire type by extrusion. 4,145,474, Cl. 428-379.000.

Keryluk, Horace T.: *See*—
Mackay, Frederick G.; Keryluk, Horace T.; and Cannon, Thomas G., 4,145,603, Cl. 219-387.000.

Keske, Robert G., to Standard Oil Company (Indiana). Polyimide from amino substituted 4-t-butylphthalic anhydride. 4,145,522, Cl. 528-331.000.

Kew, Jeffrey, to Xerox Corporation. Automatic document handling apparatus. 4,145,041, Cl. 271-233.000.

Keyser, William L.: *See*—
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,145,448, Cl. 426-72.000.

Kimball International, Inc.: *See*—
Robinson, John W.; and Dietrich, Ralph N., 4,144,787, Cl. 84-1.010.

Kimura, Tohru: *See*—
Kuwabara, Masamichi; Sasaki, Mitsuo; Uema, Sigeru; Taniguchi, Youkichi; Fukuchi, Noboru; and Kimura, Tohru, 4,145,462, Cl. 427-160.000.

King, Thomas J.: *See*—
Nilon, John W.; and King, Thomas J., 4,144,914, Cl. 141-11.000.

King, William M.; and Roberts, Jack V. Electromagnetic interference suppression system for electrical equipment. 4,145,674, Cl. 333-181.000.

Kingsley, Patrick J.; and Orr, Thomas S. C., to Fisons Limited. Method for treatment of eczema or psoriasis. 4,145,438, Cl. 424-283.000.

Kinski, Ernst. Umbrella. 4,144,900, Cl. 135-20.00A.

Kinslow, William G., to Ethyl Development Corporation. Closure fastening means. 4,144,985, Cl. 220-254.000.

Kinsman, Gordon F., to Polaroid Corporation. Method for sealing battery. 4,145,485, Cl. 429-152.000.

Kipp, Dieter; Aman, Herbert; and Hansen, Rudolf, to Robert Bosch GmbH. Electric cart drive control system. 4,145,640, Cl. 318-139.000.

Kirkbride, Bernard J.; Downey, Robert A.; Thomasson, Charles V.; and Lewis, Joseph E., to Pilkington Brothers Limited. Glazing unit. 4,144,684, Cl. 52-204.000.

Kirkel, David, to Seaquist Valve Company. One-piece powder button. 4,145,005, Cl. 239-573.000.

Kiry, Grigory S.: *See*—
Podkopaev, Boris I.; Klunko, Ivan F.; Kiry, Grigory S.; Ocheretko, Vyacheslav V.; Rozhdestvensky, Lev I.; and Chervyakova, Ljudmila D., 4,144,656, Cl. 35-9.00A.

Kishi, Takao, to Yoshino Kogyosho Co., Ltd. Liquid sprayer. 4,144,987, Cl. 222-321.000.

Kissick, Russell P. Support system for a wheeled vehicle. 4,145,069, Cl. 280-303.000.

Kiuchi, Mitsuyuki: *See*—
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,145,592, Cl. 219-10.49R.

Kiwala, Jacob: *See*—
Mookherjee, Braja D.; Withycombe, Donald A.; Katz, Ira; Goossens, Alfred E.; Vock, Manfred H.; Evers, William J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,145,354, Cl. 260-347.200.

Klaus, Gerald R., to Fellowes Manufacturing Company. Side tab file. 4,145,100, Cl. 312-261.000.

Klein, Kenneth H.: *See*—
Guenther, Harold E.; and Klein, Kenneth H., 4,144,597, Cl. 4-254.000.

Kleiner, Richard N.: *See*—
Mehalchick, Emil J.; and Kleiner, Richard N., 4,145,224, Cl. 106-73.300.

Klinkenberg, Klaus: *See*—
Bruno, Richard; Hermann, Wilhelm; Horster, Horst; Kersten, Reinhard; Klinkenberg, Klaus; Mahdjuri, Faramarz; and Bannigan, John, 4,144,875, Cl. 126-271.000.

Klotz, Arthur: *See*—
Bendig, Lothar; and Klotz, Arthur, 4,144,857, Cl. 123-122.00D.

Klunko, Ivan F.: *See*—
Podkopaev, Boris I.; Klunko, Ivan F.; Kiry, Grigory S.; Ocheretko, Vyacheslav V.; Rozhdestvensky, Lev I.; and Chervyakova, Ljudmila D., 4,144,656, Cl. 35-9.00A.

Knapp, Gregory T.; and Haney, Gordon. Ski boot scraper. 4,145,063, Cl. 280-11.37E.

Knappstein, Johannes; Stratmann, Josef; and Strobel, Manfred, to Carl Still, Firma. Adjustable device for removing pollutants from gases and vapors evolved during coke quenching operations. 4,145,195, Cl. 55-242.000.

Knoche, Karl F.; Cremer, Helmut; and Steinborn, Gerhard, to Rheinische Braunkohlenwerke Aktiengesellschaft. Process for the production of hydrogen and oxygen from water. 4,145,402, Cl. 423-579.000.

Knothe, Fritz E. Apparatus for converting centrifugal energy into percussive energy. 4,144,939, Cl. 173-49.000.

Knovl, Ernst: *See*—
Madsen, Rud F.; Knovl, Ernst; Moller, Gunther R.; and Nielsen, Werner K., 4,145,230, Cl. 127-60.000.

Knowles, Robert G., to Litton Systems, Inc. Connector with low profile latch. 4,145,103, Cl. 339-99.00R.

Kobe Steel, Limited: *See*—
Iio, Katsuro; and Osato, Akiyoshi, 4,145,598, Cl. 219-137.00R.

Koenings, Jos; and Kuppers, Dieter, to U.S. Philips Corporation. Method of producing internally coated glass tubes for the drawing of fiber-optic light conductors. 4,145,458, Cl. 427-39.000.

KOFK, Inc.: *See*—
Kelley, Omer J.; and Harper, Judson M., 4,145,028, Cl. 254-186.00R.

Kogler, Peter: *See*—
Strahsner, Emanuel; Kogler, Peter; and Zitz, Alfred J., 4,145,197, Cl. 55-401.000.

Kogure, Yoshio; and Ozawa, Shuji, to Sunpak Corporation. Device for mounting electronic flash on camera. 4,145,134, Cl. 354-295.000.

Kohler Co.: *See*—
Voigt, James R., 4,144,932, Cl. 165-80.000.
Voigt, James R., 4,145,653, Cl. 324-158.0MG.

Koizumi, Ken: *See*—
Yamazaki, Tetsuya; and Koizumi, Ken, 4,145,200, Cl. 65-2.000.

Kojima, Takafumi; Miyoshi, Tatsuru; and Mukaemachi, Takuji, to Hitachi, Ltd. Ringing control apparatus. 4,145,577, Cl. 179-18.0HB.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Sakaki, Hiroshi; and Shintani, Sotokichi, 4,145,747, Cl. 364-724.000.

Kollar, Lajos: *See*—
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.

Kollmann, Manfred A.: *See*—
Lingl, Hans, Jr.; and Kollmann, Manfred A., 4,144,977, Cl. 414-57.000.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See*—
Egnell, Rolf A.; and Moritz, Mats I., 4,145,178, Cl. 431-11.000.

Kondo Sylvania Kabushiki Kaisha: *See*—
Saito, Sozo, 4,145,631, Cl. 313-315.000.

Konishi, Yoshitaka: *See*—
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,145,555, Cl. 560-53.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Habu, Teiji; Nakano, Masashi; Tsuda, Yasuo; Sakamoto, Eiichi; and Yamada, Hiroshi, 4,145,218, Cl. 96-66.300.

Konopeskas, Leon A. Fluid displacement apparatus. 4,144,865, Cl. 123-241.000.

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Dunning, Donald R.; Koplow, Harold S.; Moros, David; Wang, An; and Wild, A. Edward, Jr., 4,145,739, Cl. 364-200.000.

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Korinth, Jurgen: *See*—
von Halasz, Sigmar P.; and Korinth, Jurgen, 4,145,311, Cl. 252-415.000.

Kosaka, Yoshiteru; and Hiraguri, Seisuke, to Victor Company of Japan, Ltd. System for controlling the rotation of a DC motor. 4,145,642, Cl. 318-331.000.

Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; and Takamura, Toshihiro, to Nippon Kokan Kabushiki Kaisha. Method for longitudinally seam-welding pipe-bland for welded steel pipe from inside along groove. 4,145,594, Cl. 219-61.000.

Kott, Isaak M.: *See*—
Goloskov, Emmanuil I.; Kott, Isaak M.; Maevsky, Genrikh A.; Pinchuk, Mikhail P.; Pljuschev, Anatoly P.; and Terlo, Vladimir I., 4,145,174, Cl. 425-78.000.

Kouguchi, Noriyuki: *See*—
Kasahara, Masao; Kouguchi, Noriyuki; Inaba, Mitugu; Kagawa, Masao; Yamada, Kunio; and Tanida, Hiroshi, 4,144,961, Cl. 198-472.000.

Kowalski, Gunter, to U.S. Philips Corporation. Device for producing two- and/or three-dimensional images of three dimensional objects. 4,145,614, Cl. 250-445.00T.

Koyama, Mitsuo: *See*—
Onda, Eiichi; Koyama, Mitsuo; Nakagawa, Tadashi; Watanabe, Masanori; and Nemoto, Ichiro, 4,145,132, Cl. 354-249.000.

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Omae, Tsutomu; Shibata, Takanori; Sakai, Keiziro; Iizuka, Tomio; and Koyama, Takaichi, 4,144,992, Cl. 228-102.000.

Kraft, Inc.: *See*—
Oles, John G., 4,145,451, Cl. 426-321.000.

Kraftwerk Union Aktiengesellschaft: *See*—
v. Schwerdtner, Otto A. V., 4,144,907, Cl. 138-39.000.

Krahn, Wilhelm E.; and Born, Manfred, to Optische Werke G. Rodenstock. Perimeter. 4,145,123, Cl. 351-24.000.

Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Fungicidally active 2-acyloxy-1-phenoxy-1-(1,2,4-triazolyl)-3,3-dimethyl-butanes. 4,145,428, Cl. 424-269.000.

Kranz, Joachim: *See*—
Thoma, Peter; Habermann, Wolfgang; and Kranz, Joachim, 4,145,264, Cl. 204-59.00R.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. 3,3-Dichloro-2-azetidinone derivatives having basic substituents. 4,145,541, Cl. 544-111.000.

Krapf, Heinz; Oppenlaender, Knut; and Seib, Karl, to BASF Aktiengesellschaft. Manufacture of water-in-oil emulsions. 4,145,307, Cl. 252-309.000.

Kraus, Peter: *See*—
Schulze, Andreas; Sasse, Klaus; Naumann, Klaus; Roessler, Peter; and Kraus, Peter, 4,145,439, Cl. 424-285.000.

Krauss-Maffei Austria Ges.m.b.H.: *See*—
Bacher, Helmuth, 4,145,172, Cl. 425-222.000.

Krautkramer-Branson, Inc.: *See*—
Kaule, Walter; and Primbsch, Erik, 4,144,767, Cl. 73-643.000.

Kreitz, Lloyd D. Dust collector for radial arm saws. 4,144,781, Cl. 83-100.000.

Kriger, Jury N.: *See*—
Rabinovich, Volf I.; Kriger, Jury N.; Sapozhnikov, Alexandr I.; Svitenko, Igor A.; Sapunov, Viktor E.; Filippov, Vyacheslav V.; and Karpov, Vladimir A., 4,145,563, Cl. 13-9.0ES.

Krizik, Jan G., to IDR Enterprises, Inc. Showerheads. 4,145,004, Cl. 239-499.000.

Krueger, Theodore H.: *See*—
Merrill, Richard E.; and Krueger, Theodore H., 4,145,216, Cl. 96-28.000.

Krumholz, Jerrold J. Racquet and return ball apparatus. 4,145,051, Cl. 273-97.00R.

Krygier, Stanley J. Maxillary orthopedic suture separating orthodontic appliance. 4,144,643, Cl. 32-14.00E.

Kubicek, Donald H., to Phillips Petroleum Company. Preparation of thioamides from amides. 4,145,352, Cl. 260-326.820.

Kubota, Kanemitsu, to Kabushiki Kaisha Suwa Seikosha. Electronic table calculator using liquid crystal display. 4,145,120, Cl. 350-332.000.

Kubota Kekko Kabushiki Kaisha: *See*—
Fukui, Hirokazu, 4,145,009, Cl. 241-194.000.

Kuckenbecker, Morris W., to American Can Company. Hinged carton. 4,144,996, Cl. 229-33.000.

Kucsma, Michael E.: *See*—
Zorzi, Paul A.; Allen, Thomas S.; and Kucsma, Michael E., 4,145,330, Cl. 260-37.00R.

Kuehn, Erich, to ICI Americas Inc. Preparation of isocyanurates. 4,145,544, Cl. 544-222.000.

Kuhfuss, Herbert F.: *See*—
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,145,518, Cl. 528-272.000.

Kuhn, S.A.: *See*—
Aron, Jerome, 4,144,699, Cl. 56-370.000.

Kulig, Francis V., to Federal Paper Board Co., Inc. Article carrier. 4,144,966, Cl. 206-188.000.

Kumoda, Masashi: *See*—
Tatara, Seiji; Domori, Yoshiki; Kumoda, Masashi; and Endo, Yusuke, 4,145,306, Cl. 252-187.00H.

Kump, Wilhelm: *See*—
Muller, Beat; Kump, Wilhelm; and Wacker, Oskar, 4,145,344, Cl. 260-239.30B.

Kunchal, S. Kumar; Erck, Louis J.; and Harris, Harry A. Gas stream cleaning system and method. 4,145,191, Cl. 55-4.000.

Kuntziger, Ernest P., to S.A. des Anciens Etablissements Paul Wurth. Hot blast stove and method of operation. 4,145,033, Cl. 266-44.000.

Kunz, Raymond W.: *See*—
Walter, Henry J.; and Kunz, Raymond W., 4,145,600, Cl. 219-222.000.

Kupka, Rudolph J. Roller skate scooter. 4,145,065, Cl. 280-87.04R.

Kuppers, Dieter; Lydtin, Hans; and Rehder, Ludwig. Method of producing internally coated glass tubes for the drawing of fibre optic light conductors. 4,145,456, Cl. 427-38.000.

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Koenings, Jos; and Kuppers, Dieter, 4,145,458, Cl. 427-39.000.

Kurihara, Toshio: *See*—
Ohkawara, Yasuo; Mizutani, Nagao; Kurihara, Toshio; and Nojima, Masamitsu, 4,145,146, Cl. 400-614.000.

Kuroda, Masataka: *See*—
Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,145,404, Cl. 423-635.000.

Kurooka, Akira: *See*—
Fujimaki, Masao; Arai, Soichi; Watanabe, Michiko; Hashimoto, Yukio; and Kurooka, Akira, 4,145,455, Cl. 426-614.000.

Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, to Novenyolajipari es Mososzergyarto Vallalat; and Budapesti Muszaki Egyetem. Process and apparatus for producing a urea fatty acid adduct consisting of solid particles. 4,145,446, Cl. 426-69.000.

Kusama, You; and Harikae, Yoshinori, to Mitsubishi Paper Mills, Ltd. Photographic paper support. 4,145,480, Cl. 428-513.000.

Kuspert, John C.: *See*—
Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., 4,145,241, Cl. 156-305.000.

Kustom Fit Manufacturing Company: *See*—
Webster, David L., 4,145,020, Cl. 248-161.000.

Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinvasa, to Canadian Patents and Development Limited. Cellulose ester ultra-filtration membranes and their manufacture. 4,145,295, Cl. 210-500.00M.

Kuwabara, Masaharu: *See*—
Nagamoto, Itsushi; Kuwabara, Masaharu; and Muroi, Kunimasa, 4,145,047, Cl. 273-73.00F.

Kuwabara, Masamichi; Sasaki, Mitsuo; Uema, Sigeru; Taniguchi, Youkichi; Fukuchi, Noboru; and Kimura, Tohru, to Toyo Aluminium Kabushiki Kaisha. Process for producing solar collectors. 4,145,462, Cl. 427-160.000.

Kuwada, Yutaka; and Meguro, Kanji, to Takeda Chemical Industries, Ltd. Thienopyridine substituted cephalosporins. 4,145,418, Cl. 424-246.000.

Kuwahara, Hajime: *See*—
Nakamoto, Koichiro; Ohyama, Nobumi; Adachi, Kiyoshi; and Kuwahara, Hajime, 4,144,741, Cl. 73-19.000.

Kuzma, Edward J., to Celanese Corporation. Process for preparing water-soluble alkyds modified with multifunctional monomers. 4,145,319, Cl. 260-22.0CB.

Kwech, Horst: *See*—
Wachs, Edward H.; and Kwech, Horst, 4,144,867, Cl. 125-14.000.

Kwiatkowski, George T.: *See*—
Hedaya, Eddie; Kawakami, James H.; and Kwiatkowski, George T., 4,145,504, Cl. 528-5.000.

Kyncl, John J.: *See*—
Winn, Martin; and Kyncl, John J., 4,145,422, Cl. 424-250.000.

Kyowa Chemical Industry Co., Ltd.: *See*—
Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,145,404, Cl. 423-635.000.

Labofina S. A.: *See*—
Bracke, William J. I.; Bertrand, Jean N. M.; and Zegers, Jacques T. L., 4,145,376, Cl. 260-876.00B.

Laboratorios Made, S.A.: *See*—
Jarque, Ricardo G.; Domingo, Mercedes A.; Cartes, Juan Bosch; Roldan, Cristobal M.; and Peinado, Fernando R., 4,145,424, Cl. 424-256.000.

Lach, Robert E.: *See*—
Loofbourow, Donald I.; and Lach, Robert E., 4,145,127, Cl. 352-79.000.

Lachnit-Fixson, Ursula; and Neumann, Friedmund, to Schering, A.G. Novel agents and novel methods for treatment of climacteric disturbances. 4,145,416, Cl. 424-238.000.

Ladanyi, Peter A., to Vipont Chemical Company. Composition for application to oral cavity and method for preparation thereof. 4,145,412, Cl. 424-58.000.

Lagerstrom, Bengt: *See*—
Nystrom, Lars I.; and Lagerstrom, Bengt, 4,144,777, Cl. 76-112.000.

Lamb, Sydney M.; and Hurt, David B., to Semionics Associates. Associative memory device with time shared comparators. 4,145,737, Cl. 364-200.000.

Lamb, Terrence R., to Art Products, Inc. Adjustable stretching frame. 4,144,660, Cl. 38-102.500.

Lambert Brake Corporation: *See*—
Wolf, Peter, 4,145,088, Cl. 303-2.000.

Lamberti, Vincent: *See*—
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,145,558, Cl. 560-180.000.

Landen, Gote G. V., to Husqvarna AB. Throttle-valve control. 4,144,770, Cl. 74-47.000.

Lane, Constance A.: *See*—
Leslie, John P.; Lane, Constance A.; and Grant, R. Peter, 4,145,466, Cl. 428-35.000.

Lang, Robert D. Aircraft cargo pallet restraint. 4,144,821, Cl. 105-465.000.

Langbein, Adolf; Weber, Karl-Heinz; and Boke, Karin, to Boehringer Ingelheim GmbH. N-[1-(3-Benzoyl-propyl)-4-piperidyl]-sulfonic acid amides and salts thereof. 4,145,427, Cl. 424-267.000.

Lange, Karl H., to Balda-Werke Photographische Gerate und Kunststoff GmbH & Co. KG. Device for controlling a camera timing means as a function of film speed. 4,145,128, Cl. 354-21.000.

Langer, Arthur W., Jr., to Exxon Research & Engineering Co. Novel trialkyl aluminum cocatalyst. 4,145,313, Cl. 252-429.00B.

Lantzsch, Reinhard: *See*—
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,145,512, Cl. 528-73.000.

Lark, John C.: *See*—
Lerman, Michael A.; and Lark, John C., 4,145,461, Cl. 427-155.000.

Larsen, Poul M., to Danfoss A/S. Circuit arrangement for determining physical parameters of flowing media by the ultrasonic method. 4,144,753, Cl. 73-194.00A.

Larson, Clinton F. Knee guard. 4,144,592, Cl. 2-22.000.

Larson, Ivar W.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,742, Cl. 364-709.000.
Olander, Emil E., Jr.; James, Rex J.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,752, Cl. 364-709.000.

Larsson, Sven G. V.: *See*—
Naess, Ture P. A.; and Larsson, Sven G. V., 4,145,097, Cl. 312-196.000.

Lascelles, Daniel J. Modular drain field section. 4,145,157, Cl. 405-43.000.

Lask, Helmut: *See*—
Holst, Arno; and Lask, Helmut, 4,144,886, Cl. 128-284.000.

Lauffer, Donald K.: *See*—
Ward, William P.; and Lauffer, Donald K., 4,145,760, Cl. 365-226.000.

Laughlin, Robert G., to Procter & Gamble Company, The. Controlled release article. 4,145,408, Cl. 424-16.000.

Laule, Thomas M., to Parise & Sons, Inc. Single tube hydro air filter with dividing wall. 4,145,198, Cl. 55-439.000.

Lavrentiev, Konstantin A.; Popov, Gennady P.; Popov, Ivan G.; Boroda, Valentin I.; and Melnichuk, Vladimir N. Electric heating installation for heating high purity liquid and gaseous media. 4,145,601, Cl. 219-298.000.

Lazarus, Jack: *See*—
Gradwell, John; and Daly, William, 4,144,672, Cl. 47-73.000.

Le Materiel Telephonique: *See*—
Petitjean, Christian H.; Marchand, Maurice E.; and Denis, Marcel, 4,145,690, Cl. 343-6.50R.

Leach, Clayton R., Jr.; and Munich, Terry L., to Fairmont Steel Products, Inc. Beaver tail platform attachment for a trailer. 4,144,979, Cl. 414-537.000.

Leach, Robert M.: *See*—
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,145,309, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,145,310, Cl. 252-358.000.

Lebedev, Evgeny I.: *See*—
Polyak, David G.; Lebedev, Evgeny I.; Esenovsky-Lashkov, Jury K.; Pyatko, Boris N.; and Mosyagin, Vladimir M., 4,144,958, Cl. 192-105.00F.

Leclercq, Jacques: *See*—
Rodriguez, Ludovic; and Leclercq, Jacques, 4,145,343, Cl. 260-239.100.

Lee, Bo T. Apparatus for growing bean sprouts. 4,144,671, Cl. 47-14.000.

Lee, Cedric, to Revertex Limited. Pressure-sensitive adhesive compositions and process for preparing them. 4,145,321, Cl. 260-27.0BB.

Lee, John H.; and Lind, Peter A., to Minnesota Mining and Manufacturing Company. Control circuit for providing time selected application of A.C. power. 4,145,617, Cl. 307-43.000.

Lee, Richard D. Ski boot and glove warmer. 4,145,602, Cl. 219-370.000.

Leffler, William T.; Hamler, Bruce W.; and Spriggs, Stephen R., to United McGill Corporation. Interlocking building panel with assembly facilitating hinge. 4,144,681, Cl. 52-127.000.

Lefort, Marcel: *See*—
Bargain, Michel; and Lefort, Marcel, 4,145,508, Cl. 528-31.000.

LEK tovarna farmacevtskih in kemicnih izdelkov, n.sol.o.: *See*—
Pelan, Borut; Milohnoja, Marija; and Pezdirc, Magda, 4,145,528, Cl. 536-7.000.

Lenhardt, Roy A., Sr., to DEC International, Inc. Method for conveying ground cheese. 4,145,453, Cl. 426-516.000.

Leningradskoe spelsialnoe konstruktorskoe bjuro polimernogo masinostroenia: *See*—
Goloskov, Emmanuil I.; Kott, Isaak M.; Maevsky, Genrikh A.; Pinchuk, Mikhail P.; Pljuschev, Anatoly P.; and Terlo, Vladimir I., 4,145,174, Cl. 425-78.000.

Lenoir, John: *See*—
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,145,217, Cl. 96-53.000.

Leonard, Louis H.: *See*—
Anderson, Carl M.; and Leonard, Louis H., 4,144,717, Cl. 62-117.000.

Lepikhov, Alexandr I.: *See*—
Sidorovich, Vladimir G.; Dokukin, Alexandr V.; Shmarian, Evgeny M.; Kazakov, Vladimir V.; and Lepikhov, Alexandr I., 4,145,744, Cl. 364-554.000.

Lerman, Michael A.; and Lark, John C., to Standard Oil Company (Indiana). Process of warp sizing which uses a low molecular weight polyester and chelated titanate in a water dispersion. 4,145,461, Cl. 427-155.000.

Leslie, John P.; Lane, Constance A.; and Grant, R. Peter, to Rohm and Haas Company. Melt strength improvement of PET. 4,145,466, Cl. 428-35.000.

Leumann, Hans E., to Bloom Engineering Company, Inc. Closure members. 4,145,259, Cl. 202-248.000.

Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, to Saint-Gobain Industries. Apparatus for forming fibers from attenuable material. 4,145,203, Cl. 65-16.000.

Lever Brothers Company: *See*—
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,145,558, Cl. 560-180.000.

Lewis, Joseph E.: *See*—
Kirkbride, Bernard J.; Downey, Robert A.; Thomasson, Charles V.; and Lewis, Joseph E., 4,144,684, Cl. 52-204.000.

Lewis, Pauls and Associates, Ltd.: *See*—
Pauls, James D.; and Hammett, Roy, 4,144,983, Cl. 215-216.000.

Lewis, Robert B.: *See*—
Campo, Edgar A.; and Lewis, Robert B., 4,144,618, Cl. 19-161.100.
Finley, Donald W.; and Lewis, Robert B., 4,145,460, Cl. 427-97.000.

Li, Steven S. Drain clearing device. 4,144,598, Cl. 4-256.000.

Lichtenvort, Uwe: *See*—
Becker, Klaus; Lichtenvort, Uwe; and Behrmann, Dieter, 4,145,042, Cl. 272-56.50R.

Lidkopings Mekaniska Verkstads AB: *See*—
Nilsson, Bengt, 4,144,677, Cl. 51-134.50R.

Liebermann, Howard H., to General Electric Company. Critical gas boundary layer Reynolds number for enhanced processing of glassy alloy ribbons. 4,144,926, Cl. 164-87.000.

Liedtke, Dieter W. Viewing instrument. 4,145,118, Cl. 350-241.000.

Lind, Peter A.: *See*—
Lee, John H.; and Lind, Peter A., 4,145,617, Cl. 307-43.000.

Lindenthal, Hans: *See*—
Armasow, Waldemar; and Lindenthal, Hans, 4,144,724, Cl. 64-17.00A.

Linder, Sten V., to Aktiebolaget Atomenergi. Electromagnetic measurement of quantities in connection with electrically conducting liquid material. 4,144,756, Cl. 73-290.00R.

Lindstrom, Nils E., to Skogsagarnas Vanerindustrier Aktiebolag. Apparatus for curved sawing of timber. 4,144,782, Cl. 83-102.100.

Lingl Corporation: *See*—
Lingl, Hans, Jr.; and Kollmann, Manfred A., 4,144,977, Cl. 414-57.000.

Lingl, Hans, Jr.; and Kollmann, Manfred A., to Lingl Corporation. Selective edge or flat setting of brick. 4,144,977, Cl. 414-57.000.

Lion Hamigaki Kabushiki Kaisha: *See*—
Takahashi, Hiroshi; Muto, Yasutami; Suzuki, Hiroshi; and Fukuda, Shiro, 4,144,675, Cl. 51-76.00R.
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,144,646, Cl. 32-40.00R.
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,144,882, Cl. 128-172.100.

L'Italien, Yvon J.; and Nordin, Ivan C., to Parke, Davis & Company. N-(Substituted-aminoalkyl)-2-oxo-1-pyrrolidineacetamides. 4,145,347, Cl. 546-208.000.

Litton Systems, Inc.: *See*—
Knowles, Robert G., 4,145,103, Cl. 339-99.00R.

Liu, Chung C.: *See*—
United States of America, National Aeronautics and Space Administration; Schiller, Julian G.; and Liu, Chung C., 4,145,255, Cl. 195-103.50R.

Liu, Raymond C., to Perkin-Elmer Corporation, The. Dual stepping angle stepper motor drive. 4,145,644, Cl. 318-696.000.

Livingston Industries, Incorporated: *See*—
Livingston, Russell G., 4,145,106, Cl. 339-143.00S.

Livingston, Russell G., to Livingston Industries, Incorporated. Shielding device for oriented spark plugs. 4,145,106, Cl. 339-143.00S.

LKB-Produkter AB: *See*—
Dzaack, Heinz, 4,144,761, Cl. 73-425.600.

Lobb, Daniel R.: *See*—
Spooner, Archer M.; and Lobb, Daniel R., 4,145,712, Cl. 358-60.000.

Lockheed Electronics Company, Inc.: *See*—
Wiig, Selmer L., 4,145,016, Cl. 242-193.000.

Loffland Brothers Company: *See*—
Johnson, Earl R.; and Watkins, Lesley G., 4,144,953, Cl. 188-134.000.

Login, Robert B.: *See*—
Newkirk, David D.; and Login, Robert B., 4,145,469, Cl. 428-245.000.

Lolk, Soren, to Danfoss A/S. Ultrasonically operative device for determining physical quantities of a medium. 4,144,752, Cl. 73-194.00A.

Longthorpe, Paul L., to Ederer Incorporated. Method of temporarily increasing the load capacity of a powered drum hoist. 4,144,974, Cl. 212-18.000.

Loofbourow, Donald I.; and Lach, Robert E., to GAF Corporation. Film transport and control mechanism for motion picture projectors. 4,145,127, Cl. 352-79.000.

Losacker, Paul: *See*—
Schenk, Norbert; Losacker, Paul; and Martin, Manfred, 4,145,353, Cl. 260-346.700.

Loudas, Basil L., to Minnesota Mining and Manufacturing Company. Cleaning and treating compositions. 4,145,303, Cl. 252-156.000.

Lucas Industries Limited: *See*—
Read, Martin A., 4,144,750, Cl. 73-194.00F.
Sivill, Alistair D., 4,144,745, Cl. 73-59.000.

Ludwig, Lawrence P.: *See*—
Hady, William F.; and Ludwig, Lawrence P., 4,145,058, Cl. 277-62.000.

LuK Lamellen und Kupplungsbau GmbH: *See*—
Maucher, Paul; and Birk, Albert, 4,144,959, Cl. 192-106.200.

Lukacs, Piroska: *See*—
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.

Lukey, Leonard F., to Fifth Patroy Proprietory Ltd. Vehicle mirrors. 4,145,023, Cl. 248-479.000.

Lumpkin, Robert E.: *See*—
Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; and Winter, Bruce L., 4,145,274, Cl. 208-8.000.

Lundberg, Robert D.; Makowski, Henry S.; and Bock, Jan, to Exxon Research & Engineering Co. Sulfonated polymer composition. 4,145,379, Cl. 260-879.000.

Lundqvist, Gunnar, to AB Holmbom & Hedlund. Device at fork-equipped machine. 4,144,982, Cl. 414-666.000.

Lydtin, Hans: *See*—
Kuppers, Dieter; Lydtin, Hans; and Rehder, Ludwig, 4,145,456, Cl. 427-38.000.

Lysfjord, John P.; and Byland, James K., to Medtronic, Inc. Heart stimulator lead set. 4,144,891, Cl. 128-419.00P.

Mabuchi, Sadao: *See*—
Toyomasu, Takeshi; Furusawa, Michito; Mabuchi, Sadao; and Gushima, Mitsuo, 4,145,068, Cl. 280-281.00R.

MacDonald, Robert W.; and Yates, Robert W., to MacDonald, Robert W. Television flaw detector for inspecting the wall surface of a hole through a circuit board. 4,145,714, Cl. 358-106.000.

MacFarlane, Thomas R.; and Sickert, Richard G., to Whirlpool Corporation. Water supply control for automatic hand washing and drying apparatus. 4,144,596, Cl. 4-166.000.

Mackay, Frederick G.; Keryluk, Horace T.; and Cannon, Thomas G., to Teledyne Industries, Inc. Food serving system. 4,145,603, Cl. 219-387.000.

Madsen, Rud F.; Knovl, Ernst; Moller, Gunther R.; and Nielsen, Werner K., to Aktieselskabet de Danske Sukkerfabrikker. Method for seeding super-saturated sugar solution to effect crystallization. 4,145,230, Cl. 127-60.000.

Maeda, Yoshio; and Matsumoto, Koichi, to Hitachi, Ltd. Control apparatus for driving a pulse motor. 4,145,643, Cl. 318-696.000.

Maehara, Kazuo, to Nippon Gakki Seizo Kabushiki Kaisha. Piano plate. 4,144,792, Cl. 84-188.000.

Maevsky, Genrikh A.: *See*—
Goloskov, Emmanuil I.; Kott, Isaak M.; Maevsky, Genrikh A.; Pinchuk, Mikhail P.; Pljuschev, Anatoly P.; and Terlo, Vladimir I., 4,145,174, Cl. 425-78.000.

Mahan, John E: *See*—
Fahey, Darryl R.; and Mahan, John E, 4,145,358, Cl. 260-439.00R.

Mahdjuri, Faramarz: *See*—
Bruno, Richard; Hermann, Wilhelm; Horster, Horst; Kersten, Reinhard; Klinkenberg, Klaus; Mahdjuri, Faramarz; and Bannigan, John, 4,144,875, Cl. 126-271.000.

Mahr, Rene N.; and Mailliet, Pierre H., to S.A. des Anciens Etablissements Paul Wurth. Isolation valve. 4,144,902, Cl. 137-246.220.

Maillefer S.A.: *See*—
Kertscher, Eberhard; and Janssen, Harald, 4,145,474, Cl. 428-379.000.

Mailliet, Pierre H.: *See*—
Mahr, Rene N.; and Mailliet, Pierre H., 4,144,902, Cl. 137-246.220.

Maisubara, Isao: *See*—
Iida, Takao; Shirahata, Kunikatsu; Maisubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,145,253, Cl. 195-96.000.

Makowski, Henry S.: *See*—
Lundberg, Robert D.; Makowski, Henry S.; and Bock, Jan, 4,145,379, Cl. 260-879.000.

Maldonado, Paul; Mas, Jean; and Phung, Trung K., to Elf Union. Process for preparing bitumen-polymer compositions. 4,145,322, Cl. 260-28.5AS.

Malik, Kuldip R., to Thiokol Corporation. Woven textile. 4,145,467, Cl. 428-91.000.

Malyshev, Boris N.; Prozorov, Vladimir N.; and Gonel-Budantsev, Igor I. Device for treatment by laser emission. 4,144,888, Cl. 128-303.100.

Manabe, Masao: *See*—
Abe, Nobuyuki; Watanabe, Osamu; Tominaga, Masami; Nunokawa, Koji; Tanaka, Ichiro; and Manabe, Masao, 4,144,942, Cl. 175-286.000.

Mantell, Gerald J.: *See*—
Dixon, Dale D.; Ford, Michael E.; and Mantell, Gerald J., 4,145,525, Cl. 528-404.000.

Marchand, Maurice E.: *See*—
Petitjean, Christian H.; Marchand, Maurice E.; and Denis, Marcel, 4,145,690, Cl. 343-6.50R.

Marcus, Konrad H., to Prince Corporation. Vehicle position indicator. 4,145,605, Cl. 235-92.0DN.

Maringer, Albert; and Otte, Hans-Henning, to Siemens Aktiengesellschaft. Method for determining a measurement value proportional to the compression of an internal combustion engine. 4,144,746, Cl. 73-117.200.

Mark, Victor; and Wilson, Phillip S., to General Electric Company. Plasticized polycarbonate composition. 4,145,329, Cl. 260-30.40R.

Marmon Company: *See*—
Bione, Angelo A.; Sehnert, Robert J.; and Taylor, Horace E., 4,144,788, Cl. 84-1.010.

Marsh, Francis X.: *See*—
Moyer, Thomas D.; Smith, Raymond; Urbani, Aldo J.; Greenburg, Harley D.; Hamburg, Glenn W.; Marsh, Francis X.; and Van Huysen, Robert S., 4,144,950, Cl. 184-6.110.

Marshall, Kenneth H., to Premach Pty. Limited. Method for preparation of dental crowns and bridges. 4,144,645, Cl. 32-42.000.

Marshall, Winston S., to Eli Lilly and Company. (Phenoxyphenyl) alkyl acetates, propionates, and carbamates. 4,145,557, Cl. 560-164.000.

Martin, Manfred: *See*—
Schenk, Norbert; Losacker, Paul; and Martin, Manfred, 4,145,353, Cl. 260-346.700.

Martin, William G.; and Simone, Anthony D., to Facet Enterprises, Inc. Fuel contamination monitor having a shut-off valve. 4,145,285, Cl. 210-100.000.

Marubeni Corporation: *See*—
Toida, Shigeo; Ohno, Akira; Higuchi, Kozo, deceased; Higuchi, Makoto, heir at law; and Higuchi, Yuko, heir at law, 4,145,397, Cl. 423-54.000.

Marumo, Nagayuki: *See*—
Yabuta, Keiichiro; Marumo, Nagayuki; Shimabara, Yoichi; Ishigaki, Masahiro; Ishihara, Ken; and Mayama, Yoshiki, 4,144,921, Cl. 152-353.00R.

Maruoka, Hiroyuki; and Shioyama, Giichi, to Nissan Motor Company, Limited. Ignition timing control change-over system. 4,144,853, Cl. 123-117.00R.

Maruyama, Koichi; Osakabe, Kuniharu; and Kawanishi, Satoshi, to Hitachi, Ltd. Color misalignment correction device for color picture tube. 4,145,677, Cl. 335-212.000.

Marwede, Gunter: *See*—
Sylvester, Gerd; Witte, Josef; and Marwede, Gunter, 4,145,497, Cl. 526-164.000.

Mas, Jean: *See*—
Maldonado, Paul; Mas, Jean; and Phung, Trung K., 4,145,322, Cl. 260-28.5AS.

Mase, Toshiyasu: *See*—
Murakami, Masuo; Takahashi, Kozo; Murase, Kiyoshi; Mase, Toshiyasu; Ida, Hisashi; and Takenaka, Toichi, 4,145,363, Cl. 260-553.00A.

Massachusetts Institute of Technology: *See*—
Misunas, David P.; and Dennis, Jack B., 4,145,733, Cl. 364-200.000.

Master Craft Engineering, Inc.: *See*—
Franks, Gerald M.; and Haswell, John W., 4,144,732, Cl. 72-84.000.

Mastrup, Frithjof N.; and Wang, John H. S., to Hughes Aircraft Company. Optical resonance pumped transfer laser with high multiline photon-to-single-line photon conversion efficiency. 4,145,668, Cl. 331-94.50P.

Masuda, Noboru, to Denki Onkyo Co., Ltd. Keyboard switch circuit for use in a matrix which has a series circuit including a reluctance element and a diode connected between each row and column of the matrix. 4,145,687, Cl. 340-365.00S.

Masuda, Yutaka: *See*—
Tohyama, Shunroku; Masuda, Yutaka; and Nogi, Tatsuo, 4,145,371, Cl. 260-856.000.

Masui, Takatoshi; and Mituyasu, Masaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for controlling the air-fuel ratio of a mixture. 4,144,855, Cl. 123-119.0EC.

Matheson, Ian A., to BP Chemicals Limited. Polymerization catalyst. 4,145,312, Cl. 252-429.00B.

Mathys, Wilbur L.: *See*—
Carlow, Earl F.; Mathys, Wilbur L.; Mensch, William D.; Peddle, Charles; and Wiles, Michael F., 4,145,751, Cl. 364-900.000.

Matschinsky, Wolfgang, to Bayerische Motoren Werke Aktiengesellschaft. Independent suspension of a steered wheel of a motor vehicle. 4,145,072, Cl. 280-668.000.

Matsubara, Saburo; and Iwai, Sakuya, to Nippon Oil Co., Ltd. Plasticized polyvinyl acetate compositions. 4,145,338, Cl. 260-33.6UA.

Matsumoto, Hiromitsu: *See*—
Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, 4,144,861, Cl. 123-179.00G.

Matsumoto, Junichiro: *See*—
Kato, Fumiaki; Iizuka, Haruhiko; and Matsumoto, Junichiro, 4,144,864, Cl. 123-198.00F.

Matsumoto, Koichi: *See*—
Maeda, Yoshio; and Matsumoto, Koichi, 4,145,643, Cl. 318-696.000.

Matsumoto, Seiji: *See*—
Iwasa, Masakazu; Matsumoto, Seiji; Honjo, Satoru; and Iida, Teruo, 4,144,808, Cl. 101-1.000.

Matsunaga, Isao: *See*—
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,145,357, Cl. 260-397.200.

Matsushima, Hideo; and Mori, Yasuki, to Abbott Laboratories. 2'-Deamino-3'-epiamino-3'-deoxy-XK-88-5 and process for the production thereof. 4,145,530, Cl. 536-17.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ichiyanagi, Takashi; Akiyama, Takashige; and Otoda, Ichizo, 4,144,838, Cl. 118-125.000.
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,145,592, Cl. 219-10.49R.

Matsuura, Masaaki, to Nippon Kogaku K.K. Film resistor having a reduced temperature coefficient of resistance. 4,145,470, Cl. 428-336.000.

Matthey Rustenburg Refiners (Pty.) Ltd.: *See*—
Oliver, Raymond E.; and McGuire, George, 4,145,187, Cl. 422-232.000.

Mattwell, Michael O. Air conditioning system with side stream filtering. 4,144,722, Cl. 62-305.000.

Mauboussin, Joel, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Devices for controlling the level of a liquid in a tank. 4,144,757, Cl. 73-308.000.

Maucher, Paul; and Birk, Albert, to LuK Lamellen und Kupplungsbau GmbH. Clutch disk assembly. 4,144,959, Cl. 192-106.200.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.: *See*—
Eckstein, Fritz; and Hobbs, John, 4,145,531, Cl. 536-26.000.

Maximovitch nee Fabre, Suzanne: *See*—
Bonnemay, Maurice; Bronoel, Guy; Maximovitch nee Fabre, Suzanne; and Sarradin, Joel, 4,145,483, Cl. 429-103.000.

Mayama, Yoshiki: *See*—
Yabuta, Keiichiro; Marumo, Nagayuki; Shimabara, Yoichi; Ishigaki, Masahiro; Ishihara, Ken; and Mayama, Yoshiki, 4,144,921, Cl. 152-353.00R.

Maycock, E. Frank; and Orr, Donald J. Fishing bobber having line retaining ring. 4,144,666, Cl. 43-44.950.

Mayer, Arthur, to Timex Corporation. Electronic compensation for temperature variation of gyroscope damping. 4,144,769, Cl. 74-5.500.

Mayes, Robert. Liquid volume control for a liquid storage tank. 4,144,600, Cl. 4-324.000.

McCarroll, Raymond A., to Herder N.V. Tilted axle caster. 4,144,617, Cl. 16-18.00A.

McCartney, Joseph F.: *See*—
Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., 4,145,484, Cl. 429-105.000.

McClean, William G.; and Budge, Daniel C., to Tri-N Associates, Inc. Filament winding apparatus. 4,145,740, Cl. 364-469.000.

McConnell, Albert L.; and Schutte, Richard W., to Scott Paper Company. Absorbent articles. 4,145,464, Cl. 428-171.000.

McDonnell, Damien G.: *See*—
Coates, David; Gray, George W.; and McDonnell, Damien G., 4,145,114, Cl. 350-349.000.

McEowen, Victor R. Method of fabricating flexible joints. 4,144,626, Cl. 29-149.50B.

McGuire, George: *See*—
Oliver, Raymond E.; and McGuire, George, 4,145,187, Cl. 422-232.000.

McGuire, Richard J.: *See*—
Bliss, George D.; Kercso, Joseph E.; and McGuire, Richard J., 4,144,841, Cl. 119-5.000.
McIntyre, Robert T. Diver's spar buoy and flag. 4,144,606, Cl. 9-8.00R.
McKeen, Robert G.: *See*—
Williams, Ronald L.; and McKeen, Robert G., 4,144,719, Cl. 62-239.000.
McKnight, Hugh P.; and Hostetler, Van B., to Eli Lilly and Company. Inspection apparatus for filled capsule. 4,144,970, Cl. 209-542.000.
McLaughlin, Michael H.: *See*—
Ferro, Armand P.; Harnden, John D., Jr.; and McLaughlin, Michael H., 4,145,708, Cl. 357-82.000.
McLean, Kenneth Milton, executor: *See*—
Henderson, William D., deceased, 4,144,915, Cl. 141-18.000.
McLean, Thomas F.: *See*—
Emerton, Barry G.; Weir, William A.; and McLean, Thomas F., 4,144,927, Cl. 164-108.000.
McLuckie, Walter L.; and Williamson, Herschel M., to Caterpillar Tractor Co. Lockup system for a vehicle suspension mechanism. 4,145,073, Cl. 280-702.000.
McMurray, Robert D.; and Hicks, James R., to Recognition Equipment Incorporated. Data compressor. 4,145,686, Cl. 340-347.0DD.
McPherren, Glen E., to Nicro Corporation. Low friction track traveler. 4,144,830, Cl. 114-204.000.
McWilliams, Dennis M.: *See*—
Bueler, Richard C.; and McWilliams, Dennis M., 4,145,091, Cl. 303-118.000.
Mead, Theodore C.; Sequeira, Avilino, Jr.; and Odell, Norman R., to Texaco Inc. Transformer oil processing. 4,145,273, Cl. 208-3.000.
Medalert Corporation: *See*—
Auerbach, Albert A., 4,144,892, Cl. 128-419.0PT.
Medding, Reuben; and Kaye, Peter D., to Consolidated Electronic Industries Pty., Ltd. Automated magnetic tape cartridge retrieval handling and replay machine. 4,145,724, Cl. 360-92.000.
Medico, John J., Jr. Solar heating and cooling collector window. 4,144,931, Cl. 165-48.00S.
Medtronic, Inc.: *See*—
Lysfjord, John P.; and Byland, James K., 4,144,891, Cl. 128-419.00P.
Meeks, Hatcher R.: *See*—
Wagaman, Neil D.; Meeks, Hatcher R.; and Alexander, Donald E., 4,145,384, Cl. 261-35.000.
Mefina S.A.: *See*—
Beuchat, Roger, 4,144,816, Cl. 102-251.000.
Meguro, Kanji: *See*—
Kuwada, Yutaka; and Meguro, Kanji, 4,145,418, Cl. 424-246.000.
Mehalchick, Emil J.; and Kleiner, Richard N., to GTE Sylvania Incorporated. Method for enhancing the crystallization rate of high purity amorphous Si_3N_4 powder, powders produced thereby and products therefrom. 4,145,224, Cl. 106-73.300.
Meienhofer, Johannes A.: *See*—
Dairman, Wallace M.; Felix, Arthur M.; Gallo-Torres, Hugo E.; Heimer, Edgar P.; and Meienhofer, Johannes A., 4,145,337, Cl. 260-112.50S.
Meier, Gunter, to Dorina Nahmaschinen GmbH. Sewing machine with a feed device. 4,144,828, Cl. 112-210.000.
Meissner, Herbert, to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft. Process for providing aluminum substrates with light-absorptive surface layer. 4,145,234, Cl. 148-6.270.
Melnichuk, Vladimir N.: *See*—
Lavrentiev, Konstantin A.; Popov, Gennady P.; Popov, Ivan G.; Boroda, Valentin I.; and Melnichuk, Vladimir N., 4,145,601, Cl. 219-298.000.
Melnick, Joseph L.; and Wallis, Craig. Resin and method for removing antimicrobials from body fluids. 4,145,304, Cl. 252-182.000.
Melocik, Grant C., to Towmotor Corporation. Hydraulic priority circuit. 4,144,946, Cl. 180-132.000.
Mende, William C., to Colgate-Palmolive Company. Pressurized foaming shaving composition. 4,145,411, Cl. 424-45.000.
Mensch, William D.: *See*—
Carlow, Earl F.; Mathys, Wilbur L.; Mensch, William D.; Peddle, Charles; and Wiles, Michael F., 4,145,751, Cl. 364-900.000.
Mercier, Alain; and Fournier, Yves, to Saint-Gobain Industries. Method and apparatus for simultaneously sealing two edges of a multiple pane window. 4,145,237, Cl. 156-107.000.
Merck & Co., Inc.: *See*—
Baldwin, John J., 4,145,425, Cl. 424-263.000.
Buynak, Eugene B.; and Hilleman, Maurice R., 4,145,252, Cl. 195-1.300.
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Bock, Mark G., 4,145,551, Cl. 544-407.000.
Grier, Nathaniel; Dybas, Richard A.; and Witzel, Bruce E., 4,145,426, Cl. 424-267.000.
Jones, Howard; and Frankshun, Robert A., 4,145,346, Cl. 260-239.55C.
Mulvey, Dennis M.; and Weinstock, Leonard M., 4,145,364, Cl. 260-578.000.
Merck Sharp & Dohme (I.A.) Corp.: *See*—
Belanger, Patrice C., 4,145,550, Cl. 544-367.000.
Mercure, Gerald. Methods of and apparatus for photographing pages of a book. 4,145,138, Cl. 355-25.000.
Merrick, George J.; Cook, George E.; and Modglin, Donald D., to Merrick Welding International, Inc. Automatic pipe welding system. 4,145,593, Cl. 219-60.00A.
Merrick Welding International, Inc.: *See*—
Merrick, George J.; Cook, George E.; and Modglin, Donald D., 4,145,593, Cl. 219-60.00A.
Merrill, Richard E.; and Krueger, Theodore H., to Seal Incorporated. Dry transfer image systems. 4,145,216, Cl. 96-28.000.
Merryman, Jerry D.; Cochran, Michael J.; and Caudel, Edward R., to Texas Instruments Incorporated. Transceiver capable of sensing a clear channel. 4,145,656, Cl. 325-25.000.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Stiklorus, Lothar, 4,145,017, Cl. 244-3.250.
Messerschmitt, David G., to Bell Telephone Laboratories, Incorporated. Phase locked loop frequency synthesizer using digital modulo arithmetic. 4,145,667, Cl. 331-16.000.
Meyer, Gustave, to Egging Company, The. Universal ejector bucket. 4,144,980, Cl. 414-725.000.
Michaels, Edwin B. Antimicrobial compositions and method for using same. 4,145,436, Cl. 424-273.00R.
Midcon Pipeline Equipment Co.: *See*—
Cottam, Spencer D., 4,145,243, Cl. 156-392.000.
Felter, John V., 4,145,102, Cl. 339-14.00P.
Middelbeek, Cornelis G.; Polano, Machiel E.; and Wolters, Tjako A., to Ballast-Nedam Groep N.V.; and Skimovex B.V. Method and device for separating a mixture. 4,145,280, Cl. 210-20.000.
Mikawa, Akikazu: *See*—
Kato, Takeshi; Tanaka, Akira; Hayashi, Jun; and Mikawa, Akikazu, 4,145,219, Cl. 96-74.000.
Mikeman, Carl H., to United States of America, Army. Apparatus for and method of testing direct-view image intensifiers. 4,145,142, Cl. 356-229.000.
Miles Laboratories, Inc.: *See*—
Schick, Lloyd A.; and Carpenter, Stephen K., 4,145,406, Cl. 424-1.000.
Miller, Albert L.: *See*—
Spain, Raymond G.; and Miller, Albert L., 4,145,472, Cl. 428-367.000.
Miller, Frank J.; and Vij, Hem R., to Fruehauf Corporation. Meat rail support system. 4,145,080, Cl. 296-183.000.
Miller - Holzwarth, Inc.: *See*—
Tausch, Gerald, 4,145,119, Cl. 350-301.000.
Miller, James B. Safety wedge and handle. 4,144,919, Cl. 145-61.00R.
Miller, Stephen J., to Chevron Research Company. Denitrification by furfural-ferric chloride extraction of a hydrodesulfurized hydrocarbonaceous oil. 4,145,277, Cl. 208-212.000.
Milliken Research Corporation: *See*—
Ingham, Robert M., Jr., 4,144,703, Cl. 57-58.890.
Pittman, Edgar H., 4,144,702, Cl. 57-58.890.
Millonzi, Lawrence A.: *See*—
Price, Lester A.; Schmid, Gerold E.; and Millonzi, Lawrence A., 4,145,645, Cl. 318-762.000.
Millray, Robert, to Allied Chemical Corporation. Resilient insert for tire inflator. 4,144,917, Cl. 141-311.00R.
Milnamow, John P., to Johnson & Johnson. Diaper with tab fastener having backing web and face web. 4,144,887, Cl. 128-287.000.
Milner, John A.: *See*—
Crosby, John; and Milner, John A., 4,145,360, Cl. 260-453.00P.
Milohnoja, Marija: *See*—
Pelan, Borut; Milohnoja, Marija; and Pezdirc, Magda, 4,145,528, Cl. 536-7.000.
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, to Argus Chemical Corporation. Stabilized synthetic resin composition. 4,145,333, Cl. 260-45.80N.
Minak, Hans-Peter: *See*—
Beise, Hans; Schlicht, Burkhard; Thiele, Manfred; Gross, Manfred; Minak, Hans-Peter; Schingnitz, Manfred; Wehner, Klaus; and Burk, Werner, 4,145,192, Cl. 55-32.000.
Mingot, Claude M., to Agence Nationale de Valorisation de la Recherche (ANVAR). Non-skid highway surfacing. 4,145,154, Cl. 404-81.000.
Minnesota Mining and Manufacturing Company: *See*—
Brookhart, Marshall R., 4,145,683, Cl. 340-146.10F.
Crone, Richard L.; and Elton, Robert L., 4,145,112, Cl. 350-103.000.
Grimm, Forrest R., 4,145,654, Cl. 337-407.000.
Grovender, Steven L., 4,144,648, Cl. 339-75.00M.
Lee, John H.; and Lind, Peter A., 4,145,617, Cl. 307-43.000.
Loudas, Basil L., 4,145,303, Cl. 252-156.000.
Mishcon, Lester, deceased (by Mishcon, Martha, executrix); and Agulnek, Harry, to Vanguard Supreme Machine Corp. Wiper control mechanism for a circular knitting machine. 4,144,726, Cl. 66-140.00R.
Mishcon, Martha, executrix: *See*—
Mishcon, Lester, deceased; and Agulnek, Harry, 4,144,726, Cl. 66-140.00R.
Mishima Kosan Co., Ltd.: *See*—
Ushio, Tetsuji; Tatsuguchi, Satoru; and Tani, Hoshiro, 4,144,993, Cl. 228-107.000.
Misunas, David P.; and Dennis, Jack B., to Massachusetts Institute of Technology. Data processing apparatus for highly parallel execution of stored programs. 4,145,733, Cl. 364-200.000.
Miszak, Pawel, to Sulzer Brothers Ltd. Forced-flow steam generator. 4,144,846, Cl. 122-479.00R.
Mitamura, Takashi: *See*—
Hattori, Kiyoshi; and Mitamura, Takashi, 4,145,539, Cl. 544-20.000.
Mitchell, George E. Retractable pulpit or the like. 4,145,099, Cl. 312-33.000.
Mitchell, George F., Jr., to Electric Power Research Institute, Inc.

Vaporization cooled and insulated electrical inductive apparatus. 4,145,679, Cl. 336-57.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Tsukamoto, Yutaka; and Nakagami, Tatsuro, 4,144,856, Cl. 123-119.00A.
Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See*—
Fujishiro, Koretoshi; and Hiyoshi, Masamitsu, 4,145,258, Cl. 202-248.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Kusama, You; and Harikae, Yoshinori, 4,145,480, Cl. 428-513.000.
Mitsui, Kazuhiko, to Olympus Optical Co., Ltd. Film cassette. 4,145,012, Cl. 242-74.000.
Mituyasu, Masaki: *See*—
Masui, Takatoshi; and Mituyasu, Masaki, 4,144,855, Cl. 123-119.0EC.
Miyakawa, Seii; and Takahashi, Naoki, to Hitachi, Ltd. Apparatus for fitting flexible annular part around an article. 4,144,639, Cl. 29-809.000.
Miyanaka, Motosi: *See*—
Tanaka, Toshio; Nakagawa, Sumio; Miyanaka, Motosi; and Tachi, Seiichi, 4,145,179, Cl. 431-29.000.
Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, to Kyowa Chemical Industry Co., Ltd. Magnesium hydroxides having novel structure, process for production thereof, and resin compositions containing them. 4,145,404, Cl. 423-635.000.
Miyoshi, Tatsuru: *See*—
Kojima, Takafumi; Miyoshi, Tatsuru; and Mukaemachi, Takuji, 4,145,577, Cl. 179-18.0HB.
Mizoguchi, Takahisa; Henmi, Hiroshi; Shima, Tsukasa; Yamashita, Yasuhiko; Uematsu, Shinichi; and Kawamura, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Composite fabric comprising a non-woven fabric bonded to woven or knitted fabric. 4,145,468, Cl. 428-239.000.
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, to Matsushita Electric Industrial Co., Ltd. Induction heating apparatus with means for detecting zero crossing point of high-frequency oscillation to determine triggering time. 4,145,592, Cl. 219-10.49R.
Mizushima, Yoshihiko: *See*—
Hata, Susumu; Kajiyama, Kenji; and Mizushima, Yoshihiko, 4,145,121, Cl. 350-355.000.
Mizutani, Nagao: *See*—
Ohkawara, Yasuo; Mizutani, Nagao; Kurihara, Toshio; and Nojima, Masamitsu, 4,145,146, Cl. 400-614.000.
Mobay Chemical Corporation: *See*—
Baron, Arthur L.; and Sivaramakrishnan, Parameswar, 4,145,373, Cl. 260-873.000.
Mobil Oil Corporation: *See*—
Chen, Albert C., 4,145,324, Cl. 260-29.40R.
Espenscheid, Wilton F.; and Yan, Tsoung Y., 4,145,188, Cl. 44-50.000.
Haag, Werner O.; and Whitehurst, Darrell D., 4,145,486, Cl. 521-31.000.
Rodewald, Paul G., 4,145,315, Cl. 252-455.00Z.
Modglin, Donald D.: *See*—
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Murakami, Masuo; Takahashi, Kozo; Murase, Kiyoshi; Mase, Toshiyasu; Ida, Hisashi; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co., Ltd. 4-Carbamoylamino-α-aminomethylbenzyl alcohol derivatives. 4,145,363, Cl. 260-553.00A.

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Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tamada, Shigeharu; and Tanimura, Kaoru, to Otsuka Pharmaceutical Co., Ltd. 5-[1-Hydroxy-2-(heterocyclic-amino)]alkyl-8-hydroxy-3,4-dihydrocarbostyril derivatives. 4,145,542, Cl. 544-128.000.

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Nakamoto, Koichiro; Ohyama, Nobumi; Adachi, Kiyoshi; and Kuwahara, Hajime, to Doryokuro Kakunenryo Kaihatsu-Jigyodan; and Yokogawa Electric Works, Ltd. Void detecting device. 4,144,741, Cl. 73-19.000.

Nakamura, Kengi; and Yamamoto, Hiroshi, to Shimadzu Seisakusho Ltd. Zig zag scanning densitometer with base line and impurity correction. 4,145,139, Cl. 356-73.000.

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Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.
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Nippondenso Co., Ltd.: *See—*
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Nagaoka, Tokuzo; Nishimura, Takamoto; Ono, Satoru; Nagata, Simaiti; Yamashita, Naoki; Tanaka, Yoshiyuki; and Hatabu, Yoshihiko, 4,145,399, Cl. 423-235.000.
Nissan Motor Company, Limited: *See—*
Fujii, Toshihiko, 4,145,239, Cl. 156-212.000.
Hosaka, Akio, 4,144,847, Cl. 123-32.0EE.
Kato, Fumiaki; Iizuka, Haruhiko; and Matsumoto, Junichiro, 4,144,864, Cl. 123-198.00F.
Maruoka, Hiroyuki; and Shioyama, Giichi, 4,144,853, Cl. 123-117.00R.
Muranaka, Shigeo; Takagi, Yasuo; Araki, Yasushi; and Kakuta, Katsuyo, 4,144,860, Cl. 123-148.00C.
Nakamura, Koyo; Nakajima, Masayasu; and Ohnishi, Akihiro, 4,145,272, Cl. 204-195.00S.
Yabuta, Keiichiro; Marumo, Nagayuki; Shimabara, Yoichi; Ishigaki, Masahiro; Ishihara, Ken; and Mayama, Yoshiki, 4,144,921, Cl. 152-353.00R.
Yamamori, Takahiro; and Ohtsuka, Kunio, 4,144,776, Cl. 74-759.000.
Nitto Chemical Industry Co., Ltd.: *See—*
Takeda, Tukasa, 4,145,591, Cl. 219-10.49R.
Niwa, Tatsuhiko: *See—*
Nagano, Mineo; Awazawa, Shigeru; and Niwa, Tatsuhiko, 4,145,499, Cl. 526-201.000.
Noble, Peter M., to Westinghouse Air Brake Company. Optical instrument for setting the position of a filament of a signal lamp. 4,145,141, Cl. 356-123.000.
Noda, Fumiyoshi; and Sugiyama, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Integrated catalyst component for exhaust gas purification and method of assembling it. 4,144,627, Cl. 29-157.00R.
Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,145,015, Cl. 242-84.20A.
Nogi, Tatsuo: *See—*
Tohyama, Shunroku; Masuda, Yutaka; and Nogi, Tatsuo, 4,145,371, Cl. 260-856.000.
Nojima, Masamitsu: *See—*
Ohkawara, Yasuo; Mizutani, Nagao; Kurihara, Toshio; and Nojima, Masamitsu, 4,145,146, Cl. 400-614.000.
Nonogaki, Hajime: *See—*
Inoue, Koichi; Nonogaki, Hajime; Urakawa, Tatsuo; and Shimizu, Kazuyuki, 4,145,738, Cl. 364-200.000.
Nordin, Ivan C.: *See—*
L'Italien, Yvon J.; and Nordin, Ivan C., 4,145,347, Cl. 546-208.000.
Nordson Corporation: *See—*
Akers, Larry D.; Scholl, Charles H.; Smith, Joseph S.; and Williams, Edward A., 4,144,913, Cl. 141-2.000.
Noren, Tore H. Rotary spray manifold. 4,145,002, Cl. 239-110.000.
Norfin, Inc.: *See—*
Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., 4,145,241, Cl. 156-305.000.
Norlux A/S: *See—*
Saenger, Leif H.; and Danielsen, Per R., 4,144,663, Cl. 40-406.000.
Northern Telecom Limited: *See—*
Szentesi, Otto I., 4,145,110, Cl. 350-96.150.
Nosse, Yoshinori; Ono, Tomoyoshi; Suzuki, Hideaki; Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, to Teijin Limited. Method for regenerating oxidized photographic developers. 4,145,271, Cl. 204-180.00P.
Novak, George E.: *See—*
Greenfield, Lawrence P.; Novak, George E.; and Stone, Daniel H., 4,145,079, Cl. 295-21.000.
Novenyolajipari es Mososzergyarto Vallalat: *See—*
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.
Nozaki, Kenzie: *See—*
Gatti, Anthony R.; Hokanson, James S.; and Nozaki, Kenzie, 4,145,297, Cl. 252-25.000.
Nozawa, Yoshinori: *See—*
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,145,155, Cl. 404-98.000.
Nunn, Robert E.: *See—*
Cutter, Louis A.; and Nunn, Robert E., 4,145,375, Cl. 260-874.000.
Nunokawa, Koji: *See—*
Abe, Nobuyuki; Watanabe, Osamu; Tominaga, Masami; Nunokawa, Koji; Tanaka, Ichiro; and Manabe, Masao, 4,144,942, Cl. 175-286.000.
Nygaard, Nils H.: *See—*
Nielsen, Kaj; and Nygaard, Nils H., 4,145,647, Cl. 318-810.000.
Nyi, Kayson: *See—*
Emmons, William D.; and Nyi, Kayson, 4,145,503, Cl. 526-282.000.
Nyltite Corporation of America: *See—*
Gould, Charna; and Gould, William, 4,144,616, Cl. 16-2.000.
Nystrom, Lars I.; and Lagerstrom, Bengt, to Sandvik Aktiebolag. Circular saw blade and method for making the same. 4,144,777, Cl. 76-112.000.
Oak Industries Inc.: *See—*
Guif, Stanley E.; Nimmer, Terry L.; Weigt, Donald A.; Wolenec, Glenn; and Gall, Richard C., 4,145,717, Cl. 358-121.000.
Oatley, Gerald A. Domestic low temperature and warming unit. 4,144,869, Cl. 126-19.00M.

Oberrieth, Richard: *See—*
O'Keefe, Michael G.; and Oberrieth, Richard, 4,144,804, Cl. 99-452.000.
O'Brien, John P. Golf training device. 4,145,055, Cl. 273-187.00B.
Occidental Petroleum Corporation: *See—*
Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; and Winter, Bruce L., 4,145,274, Cl. 208-8.000.
Ocheretko, Vyacheslav V.: *See—*
Podkopaev, Boris I.; Klunko, Ivan F.; Kiry, Grigory S.; Ocheretko, Vyacheslav V.; Rozhdestvensky, Lev I.; and Chervyakova, Ljudmila D., 4,144,656, Cl. 35-9.00A.
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, to Chugai Syiyaku Kabushiki Kaisha. Steroid derivatives and process for preparing the same. 4,145,357, Cl. 260-397.200.
Ochiai, Michihiko; Morimoto, Akira; Aki, Osami; and Okada, Taiiti, to Takeda Chemical Industries, Ltd. 7β-Phosphoramido-7α-methoxycephalosporanic acid derivatives. 4,145,540, Cl. 544-21.000.
Ochiai, Yoshihito: *See—*
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,144,646, Cl. 32-40.00R.
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,144,882, Cl. 128-172.100.
Odell, Norman R.: *See—*
Mead, Theodore C.; Sequeira, Avilino, Jr.; and Odell, Norman R., 4,145,273, Cl. 208-3.000.
Oehr, Klaus H., to British Columbia Research Council. Method of conducting an electrolysis. 4,145,268, Cl. 204-149.000.
Oertel, Harald: *See—*
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,145,512, Cl. 528-73.000.
Off, Joseph W. A.; and Early, Judson H., to Haggar Company. Method of manufacturing garments. 4,145,388, Cl. 264-24.000.
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, to Kabushiki Kaisha Komatsu Seisakusho. Paving material extrusion molding apparatus. 4,145,155, Cl. 404-98.000.
Ogasawala, Nobuhiko: *See—*
Katada, Hirosi; Ogasawala, Nobuhiko; and Hashimoto, Hideyuki, 4,144,854, Cl. 123-117.00R.
Ogata, Takeru, to Toyo Co., Ltd. Food packaging method and apparatus. 4,144,693, Cl. 53-433.000.
Ogawa, Iwakichi, to Takara Co., Ltd. Multiple function water-going toy. 4,144,669, Cl. 46-17.000.
Ohara, Hitoshi: *See—*
Asaka, Urataro; and Ohara, Hitoshi, 4,144,850, Cl. 123-52.00M.
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Taniguchi, Yoshiko; Saito, Masumi; and Sakata, Ryozo, to Bridgestone Tire Company Limited. Excellent flame-and smoke-retardant non-shrinkable polyurethane foam. 4,145,318, Cl. 521-112.000.
Ohio Art Company, The: *See—*
Wilson, Lowell T.; and Plassmann, Herbert A., 4,145,044, Cl. 273-1.50R.
Ohkawa, Tihiro; and Chin, Jack, to General Atomic Company. In situ regeneration of the first wall of a deuterium-tritium fusion device. 4,145,250, Cl. 176-3.000.
Ohkawara, Yasuo; Mizutani, Nagao; Kurihara, Toshio; and Nojima, Masamitsu, to Citizen Watch Co. Ltd. Recording medium feeding apparatus for printer. 4,145,146, Cl. 400-614.000.
Ohki, Yoshinori; and Hirokichi, Komiya, to Iida Denki Kogyo K.K. Oven-rotation prevention method and circuit in the non-contact type ignition circuit for the internal combustion engine. 4,144,859, Cl. 123-148.0CC.
Ohnishi, Akihiro: *See—*
Nakamura, Koyo; Nakajima, Masayasu; and Ohnishi, Akihiro, 4,145,272, Cl. 204-195.00S.
Ohno, Akira: *See—*
Toida, Shigeo; Ohno, Akira; Higuchi, Kozo, deceased; Higuchi, Makoto, heir at law; and Higuchi, Yuko, heir at law, 4,145,397, Cl. 423-54.000.
Ohtsuka, Kunio: *See—*
Yamamori, Takahiro; and Ohtsuka, Kunio, 4,144,776, Cl. 74-759.000.
Ohwaku, Yoshinari: *See—*
Yamamoto, Yokichi; and Ohwaku, Yoshinari, 4,145,506, Cl. 528-10.000.
Ohyama, Nobumi: *See—*
Nakamoto, Koichiro; Ohyama, Nobumi; Adachi, Kiyoshi; and Kuwahara, Hajime, 4,144,741, Cl. 73-19.000.
Oil States Rubber Co.: *See—*
Britton, Fred G.; Richardson, Murl R.; and von Bose, Robert J., 4,145,158, Cl. 405-208.000.
Okachi, Ryo: *See—*
Iida, Takao; Shirahata, Kunikatsu; Maisubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,145,253, Cl. 195-96.000.
Okada, Akira: *See—*
Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,145,404, Cl. 423-635.000.
Okada, Taiiti: *See—*
Ochiai, Michihiko; Morimoto, Akira; Aki, Osami; and Okada, Taiiti, 4,145,540, Cl. 544-21.000.
Okada, Takanori: *See—*
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,145,555, Cl. 560-53.000.
Okazaki, Tosihumi: *See—*
Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,145,404, Cl. 423-635.000.
O'Keefe, Michael G.; and Oberrieth, Richard, to On-Line Instrumentation, Inc. Apparatus for continuously controlling butterfat content of reconstituted milk. 4,144,804, Cl. 99-452.000.
Oki Electric Industry Co., Ltd.: *See—*
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.
Okuyama, Toru: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Taniguchi, Yoshiko; Saito, Masumi; and Sakata, Ryozo, 4,145,318, Cl. 521-112.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including user-definable keys. 4,145,742, Cl. 364-709.000.
Olander, Emil E., Jr.; James, Rex J.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including separate line numbering means for user-definable functions. 4,145,752, Cl. 364-709.000.
Oles, John G., to Kraft, Inc. Preservation of low acid food products in the absence of chemical preservatives. 4,145,451, Cl. 426-321.000.
Olin Corporation: *See—*
Farrall, Dennis L., 4,145,533, Cl. 536-60.000.
Wojtowicz, John A.; and Herms, William C., 4,145,543, Cl. 544-190.000.
Oliver, Raymond E.; and McGuire, George, to Matthey Rustenburg Refiners (Pty.) Ltd. Treatment of material with hydrogen chloride. 4,145,187, Cl. 422-232.000.
Olliges, William E., to Universal Research Laboratories, Inc. Analog to digital video game conversion. 4,145,043, Cl. 273-1.00E.
Olsen, Robert A., to American Hospital Supply Corporation. Modular selector valve assembly. 4,144,644, Cl. 32-22.000.
Olympus Optical Co., Ltd.: *See—*
Ikeda, Yoshitsugi, 4,145,116, Cl. 350-214.000.
Ikeda, Yoshitsugi, 4,145,117, Cl. 350-214.000.
Itaya, Hideo, 4,145,108, Cl. 350-175.00E.
Mitsui, Kazuhiko, 4,145,012, Cl. 242-74.000.
Omae, Tsutomu; Shibata, Takanori; Sakai, Keiziro; Iizuka, Tomio; and Koyama, Takaichi, to Hitachi, Ltd. Method for controlling an automatic pipe welder. 4,144,992, Cl. 228-102.000.
On-Line Instrumentation, Inc.: *See—*
O'Keefe, Michael G.; and Oberrieth, Richard, 4,144,804, Cl. 99-452.000.
Onda, Eiichi; Koyama, Mitsuo; Nakagawa, Tadashi; Watanabe, Masanori; and Nemoto, Ichiro, to Seiko Koki Kabushiki Kaisha. Opening and closing device of a camera shutter mechanism. 4,145,132, Cl. 354-249.000.
Ono Pharmaceutical Company: *See—*
Hayashi, Masaki; Kori, Seiji; Arai, Yoshinobu; Okada, Takanori; and Konishi, Yoshitaka, 4,145,555, Cl. 560-53.000.
Ono, Satoru: *See—*
Nagaoka, Tokuzo; Nishimura, Takamoto; Ono, Satoru; Nagata, Simaiti; Yamashita, Naoki; Tanaka, Yoshiyuki; and Hatabu, Yoshihiko, 4,145,399, Cl. 423-235.000.
Ono, Takezo: *See—*
Nosse, Yoshinori; Ono, Tomoyoshi; Suzuki, Hideaki; Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,145,271, Cl. 204-180.00P.
Ono, Tomoyoshi: *See—*
Nosse, Yoshinori; Ono, Tomoyoshi; Suzuki, Hideaki; Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,145,271, Cl. 204-180.00P.
Opitz, Konrad; and Uhde, Christa, to Hoechst Aktiengesellschaft. Process for the preparation of disperse dyes having good printing properties for transfer printing. 4,145,182, Cl. 8-39.00R.
Oppenlaender, Knut: *See—*
Krapf, Heinz; Oppenlaender, Knut; and Seib, Karl, 4,145,307, Cl. 252-309.000.
Optische Werke G. Rodenstock: *See—*
Krahn, Wilhelm E.; and Born, Manfred, 4,145,123, Cl. 351-24.000.
Orcutt, John W., to Texas Instruments Incorporated. Condition responsive apparatus having freely disposed disc. 4,145,588, Cl. 200-83.00P.
Orr, Donald J.: *See—*
Maycock, E. Frank; and Orr, Donald J., 4,144,666, Cl. 43-44.950.
Orr, Thomas S. C.: *See—*
Kingsley, Patrick J.; and Orr, Thomas S. C., 4,145,438, Cl. 424-283.000.
Orriss, Richard A., to Bell Telephone Laboratories, Incorporated. Position access preference method. 4,145,578, Cl. 179-27.00D.
Ortemond, Leon D. Method and apparatus for installing an offshore pile driving rig. 4,144,940, Cl. 175-5.000.
Ortofon Manufacturing A/S: *See—*
Nakatsuka, Hisayoshi, 4,145,582, Cl. 179-100.41K.
Osakabe, Kuniharu: *See—*
Maruyama, Koichi; Osakabe, Kuniharu; and Kawanishi, Satoshi, 4,145,677, Cl. 335-212.000.
Osato, Akiyoshi: *See—*
Iio, Katsuro; and Osato, Akiyoshi, 4,145,598, Cl. 219-137.00R.
Oshgan, Thomas J.; and Polomsky, Ronald W., to Motorola Inc. Removable microphone hangup adapter. 4,145,583, Cl. 179-146.00R.
Oskarsson, Rolf G.; and Ekemar, Carl S. G., to Sandvik Aktiebolg. Wear resistant alloy. 4,145,213, Cl. 75-238.000.

Otoda, Ichizo: *See—*
Ichiyanagi, Takashi; Akiyama, Takashige; and Otoda, Ichizo, 4,144,838, Cl. 118-125.000.

Otofuji, Kiyoshi, to Hitachi Denshi Kabushiki Kaisha. Sweep control circuit for oscilloscope. 4,145,662, Cl. 328-181.000.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tamada, Shigeharu; and Tanimura, Kaoru, 4,145,542, Cl. 544-128.000.

Otsuki, Yutaka: *See—*
Kaiya, Atsushi; Otsuki, Yutaka; and Horii, Hideo, 4,145,501, Cl. 526-217.000.

Otte, Hans-Henning: *See—*
Maringer, Albert; and Otte, Hans-Henning, 4,144,746, Cl. 73-117.200.

Otterlei, Jon L. Flexible keyboard switch with integral spacer protrusions. 4,145,584, Cl. 200-5.00A.

Otto Engineering, Inc.: *See—*
Repplinger, Thomas J., 4,145,590, Cl. 200-330.000.

Oude Alink, Bernardus A., to Petrolite Corporation. Process for preparing tetrahydropyrimidines. 4,145,545, Cl. 544-242.000.

Overath, Albrecht: *See—*
Mucha, Horst; Arnoldi, Wilhelm; Fattler, Kurt; Overath, Albrecht; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; and Audi, Josef, 4,145,723, Cl. 360-79.000.

Owens-Corning Fiberglas Corporation: *See—*
Hayden, David E., 4,145,488, Cl. 521-177.000.
Phillips, John D., 4,145,201, Cl. 65-2.000.
Roberts, Michael G.; and Bolen, Charles E., 4,145,381, Cl. 260-880.00R.
Russell, Robert G., 4,145,199, Cl. 65-2.000.

Owens-Illinois, Inc.: *See—*
Farkas, Daniel S.; and Perry, Philip D., 4,145,204, Cl. 65-164.000.
Farkas, Daniel S.; and Ferenczy, Erwin M., 4,145,205, Cl. 65-164.000.
Go, Santos W., 4,145,517, Cl. 528-173.000.

Owens, Jack L.: *See—*
Horlacher, Walter R., Jr.; and Owens, Jack L., 4,145,194, Cl. 55-242.000.

Ozaki, Kazuyoshi. Automatically-openable-and-closable-door operating apparatus. 4,145,641, Cl. 318-269.000.

Ozawa, Shuji: *See—*
Kogure, Yoshio; and Ozawa, Shuji, 4,145,134, Cl. 354-295.000.

P. R. Mallory & Co. Inc.: *See—*
Sweany, Louis P., 4,145,688, Cl. 340-391.000.

Pack, John L.: *See—*
Babcock, Richard V.; Pack, John L.; and Hundstad, Richard L., 4,145,669, Cl. 331-94.5PE.

Palloch, Herbert, to Teledyne Mid-America Corporation. V-belt pulley. 4,144,755, Cl. 74-230.010.

Pan, Yen-Chi: *See—*
Fung, Shun C.; and Pan, Yen-Chi, 4,145,314, Cl. 252-437.000.

Pandres, Dave, Jr. Ratio preserving control system for a lens. 4,145,732, Cl. 364-109.000.

Paoletti, Rodolfo: *See—*
Ferruti, Paolo; and Paoletti, Rodolfo, 4,145,320, Cl. 260-23.0AR.

Papazian, Chris C., Sr. Bomber game with spring apart target. 4,145,049, Cl. 273-95.00B.

Parcor: *See—*
Heymes, Alain, 4,145,552, Cl. 546-51.000.

Parise & Sons, Inc.: *See—*
Laule, Thomas M., 4,145,198, Cl. 55-439.000.

Parke, Davis & Company: *See—*
L'Italien, Yvon J.; and Nordin, Ivan C., 4,145,347, Cl. 546-208.000.
Woo, Peter W. K.; and Haskell, Theodore H., 4,145,529, Cl. 536-17.000.

Parsons, George H., Jr.; and Eller, Thomas, to Baxter Travenol Laboratories, Inc. Labeled 5,5-diphenylhydantoin derivatives for radioimmunoassay. 4,145,407, Cl. 424-1.000.

Pasarela, Nunzio R., to American Cyanamid Company. Acaricidal resin composition containing spiro[cyclopropane-1,-1'-indene]-2-carboxylic acid, 3,3-dimethyl-, α-cyano-m-phenoxybenzyl ester. 4,145,409, Cl. 424-16.000.

Pauls, James D.; and Hammett, Roy, to Lewis, Pauls and Associates, Ltd. Child-resistant closure. 4,144,983, Cl. 215-216.000.

Pechersky, Mikhail A.: *See—*
Vinogradov, Alexandr P.; Pechersky, Mikhail A.; and Tkachenko, Andrei S., deceased, 4,144,748, Cl. 73-146.000.

Peddle, Charles: *See—*
Carlow, Earl F.; Mathys, Wilbur L.; Mensch, William D.; Peddle, Charles; and Wiles, Michael F., 4,145,751, Cl. 364-900.000.

Pedersen, Harry: *See—*
Ellwanger, Charles G.; and Pedersen, Harry, 4,144,678, Cl. 51-288.000.

Peeling, Philip R.: *See—*
Fitch, Steven J.; and Peeling, Philip R., 4,145,395, Cl. 423-1.000.

Peinado, Fernando R.: *See—*
Jarque, Ricardo G.; Domingo, Mercedes A.; Cartes, Juan Bosch; Roldan, Cristobal M.; and Peinado, Fernando R., 4,145,424, Cl. 424-256.000.

Pelan, Borut; Milohnoja, Marija; and Pezdirc, Magda, to LEK tovarna farmacevtskih in kemicnih izdelkov, n.sol.o. Process for preparing β-methyldigoxin. 4,145,528, Cl. 536-7.000.

Pellizzon, Tullio: *See—*
Croce, Piero D.; Pellizzon, Tullio; Schwarz, Peter; and Piccolo, Luigi, 4,145,228, Cl. 106-304.000.

Pelosi, Stanford S., Jr.; and Yu, Chia-Nien, to Morton-Norwich Products, Inc. 2-[[5-(4-Chlorophenyl)furfurylamino]methyl]pyridine dihydrochloride. 4,145,348, Cl. 546-283.000.

Pelzer, Rudolf; and Scholl, Heinz, to Saint-Gobain Industries. Film-forming head. 4,145,173, Cl. 425-224.000.

Pepper, Roger T.: *See—*
Kendall, Ernest G.; and Pepper, Roger T., 4,145,471, Cl. 428-366.000.

Perilhou, Jean R., to U.S. Philips Corporation. Method of and device for computed tomography. 4,145,610, Cl. 250-367.000.

Peripheral Dynamics, Inc.: *See—*
Auchinleck, Richard J.; Schisselbauer, John C.; Garczynski, John S.; Jablanofsky, Charles C.; and Dobson, Charles J., 4,145,606, Cl. 235-477.000.

Perkin-Elmer Corporation, The: *See—*
Liu, Raymond C., 4,145,644, Cl. 318-696.000.

Perkins, Gerald S.; and Moore, Nicholas R., to California Institute of Technology. Long stroke pump. 4,145,165, Cl. 417-418.000.

Perry, Philip D.: *See—*
Farkas, Daniel S.; and Perry, Philip D., 4,145,204, Cl. 65-164.000.

Pervin, Kathryn L.: *See—*
Sullivan, Richard A.; Sullivan, Debra; Stumboli, Mark; and Pervin, Kathryn L., 4,145,050, Cl. 273-96.00R.

Peters, Kenneth D.; and Anderson, Charles H., to RCA Corporation. Modular guided beam flat display device. 4,145,633, Cl. 313-422.000.

Peterson, Charles E.: *See—*
Edwards, Earl G.; and Peterson, Charles E., 4,145,181, Cl. 432-60.000.

Peterson, Clyde O.: *See—*
Cumming, Allen R.; and Peterson, Clyde O., 4,144,815, Cl. 102-214.000.

Peth, Horst: *See—*
Hess, Heinz; and Peth, Horst, 4,145,706, Cl. 358-10.000.

Petitjean, Christian H.; Marchand, Maurice E.; and Denis, Marcel, to Le Materiel Telephonique. Ciphering device improving the secrecy of the encoded replies of a secondary radar. 4,145,690, Cl. 343-6.50R.

Petrille, Dennis G.; and Culbertson, George S., to Standard Oil Company (Indiana). Oxidation of rubbery polymeric hydrocarbons. 4,145,493, Cl. 526-58.000.

Petrolite Corporation: *See—*
Oude Alink, Bernardus A., 4,145,545, Cl. 544-242.000.

Petrov, Jury V.: *See—*
Aroshidze, Jury V.; Iogansen, Vadim I.; Kadi-ogly, Ibragim A.; Petrov, Jury V.; Ptakul, Izrail A.; Romanov, Vasily V.; Sudarikov, Vasily L.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; and Shkoda, Gennady V., 4,145,626, Cl. 310-91.000.

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Anderson, John E.; and Kallenberger, Robert H., 4,144,997, Cl. 236-15.0BF.
Blackwell, Jennings P., 4,145,326, Cl. 260-29.60F.
Fahey, Darryl R.; and Mahan, John E, 4,145,358, Cl. 260-439.00R.
Farrar, Ralph C., 4,145,498, Cl. 526-178.000.
Hitzman, Donald O., 4,145,445, Cl. 426-60.000.
Kubicek, Donald H., 4,145,352, Cl. 260-326.820.
Trepka, William J., 4,145,298, Cl. 252-51.50A.

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Pickton, Shailer T., to Systron-Donner Corporation. Amplitude insensitive voltage-to-current converter and method for conversion. 4,145,649, Cl. 323-4.000.

Picquendar, Jean-Edgar, to Thomson-CSF. Charged-coupled device filter. 4,145,675, Cl. 333-165.000.

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Pilkington Brothers Limited: *See—*
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Uemura, Hiroki; and Saeki, Yoshifumi, 4,145,716, Cl. 358-118.000.

Piotrowski, Wieslaw S., to TRW Inc. Microwave ferrite circulator having dielectric tube for housing circulator elements. 4,145,672, Cl. 333-1.100.

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Mol, Hans C., 4,145,037, Cl. 270-58.000.
Mol, Hans C., 4,145,038, Cl. 270-58.000.
Pittman, Edgar H., to Milliken Research Corporation. Open end spun slub yarn. 4,144,702, Cl. 57-58.890.
Pitts, Robert W., Jr.; and Arnold, Dan M., to Texaco Inc. Multiphase fluid flow meter. 4,144,754, Cl. 73-205.00D.
Plama Plastic Metallic Limited: *See—*
Polzin, Renee, 4,145,240, Cl. 156-230.000.
Plantard, Dominique: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,145,203, Cl. 65-16.000.
Plass, Ludolf, to Vereinigte Aluminium-Werke A.G. Bauxite digestion by caustic alkali with improved heat transfer in tubular reactors. 4,145,398, Cl. 423-121.000.
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Pljuschev, Anatoly P.: *See—*
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Valcalda, Florent, 4,144,964, Cl. 198-830.000.
Pocklington, Terence W., to Colgate-Palmolive Company. Pressureless tennis ball. 4,145,045, Cl. 273-61.00C.
Podkopaev, Boris I.; Klunko, Ivan F.; Kiry, Grigory S.; Ocheretko, Vyacheslav V.; Rozhdestvensky, Lev I.; and Chervyakova, Ljudmila D., to Moskovsky Gosudarstvenny Pedagogichesky Institut Inostrannykh Yazykov Imeni M. Toreza. Teaching machine for studying foreign and native languages. 4,144,656, Cl. 35-9.00A.
Poggio, Mario; and Muratore, Federico, to WABCO Westinghouse. Protective device for railroad signaling apparatus. 4,145,018, Cl. 246-34.00R.
Pogozelski, Vincent F.; and Conger, Robert P., to Congoleum Corporation. Method of forming storage-stable polyurethane prepolymers. 4,145,515, Cl. 528-77.000.
Polano, Machiel E.: *See—*
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Bagby, John P.; Hapke, Kenyon A.; and Wells, Thomas R., 4,145,126, Cl. 352-74.000.
Kinsman, Gordon F., 4,145,485, Cl. 429-152.000.
Wareham, Richard R., 4,145,133, Cl. 354-275.000.
Polomsky, Ronald W.: *See—*
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Polylok Corporation: *See—*
Duhl, Daniel; and Wall, Denton B., 4,144,727, Cl. 66-192.000.
Polzin, Renee, to Plama Plastic Metallic Limited. Process for the manufacture of an article of laminated plastics having improved surface characteristics. 4,145,240, Cl. 156-230.000.
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Bruylants, Philippe M.; Fripiat, Jose J.; Rodrigue, Luc W.; Poncelet, Georges M.; and Munaut, Antonin A., 4,145,301, Cl. 252-62.560.
Ponchaux, Jean-Luc. Fluid machine. 4,144,799, Cl. 91-488.000.
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Popov, Gennady P.: *See—*
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Fasullo, Eugene J.; and Hahn, Daniel M., 4,145,153, Cl. 404-73.000.
Porta, Paolo D.; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, to SAES Getters S.p.A. Process for producing ethylene oxide. 4,145,355, Cl. 260-348.340.
Porter, Donald F. Solar heat collector. 4,144,871, Cl. 126-270.000.
Portmann, Hubert, to Ebauches SA. Safety device for battery-operated watches. 4,144,704, Cl. 58-23.0BA.
Posey, Fred R., Jr.: *See—*
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Pouliot, Harvey N.: *See—*
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PPG Industries, Inc.: *See—*
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Premach Pty. Limited: *See—*
Marshall, Kenneth H., 4,144,645, Cl. 32-42.000.
Price, Lester A.; Schmid, Gerold E.; and Millonzi, Lawrence A., to Harnischfeger Corporation. Speed control means for squirrel-cage motor. 4,145,645, Cl. 318-762.000.
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Marcus, Konrad H., 4,145,605, Cl. 235-92.0DN.
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Laughlin, Robert G., 4,145,408, Cl. 424-16.000.
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Prosen, Gildo G., to Promac Corporation. Variable compression ratio engine. 4,144,851, Cl. 123-78.00C.
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Malyshev, Boris N.; Prozorov, Vladimir N.; and Gonel-Budantsev, Igor I., 4,144,888, Cl. 128-303.100.
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Pullman Incorporated: *See—*
Cook, John, 4,145,682, Cl. 340-52.00H.
Pundyk, Bernard, to Glamorise Foundations, Inc. Brassiere having independently adjustable breast cups. 4,144,912, Cl. 128-484.000.
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Pure Cycle Corporation: *See—*
Selby, Howard W., III, 4,145,279, Cl. 210-17.000.
Purssell, Robert F., to Ranco Incorporated. Snap action switches. 4,145,587, Cl. 200-67.0DA.
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Quaker Oats Company, The: *See—*
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,145,448, Cl. 426-72.000.
Quast, Danny H.; Fermenich, Dennis R.; and Granof, Herman H. System and method for introducing systemic treatment liquids into trees and similar plants. 4,144,673, Cl. 47-57.500.
Quinn, Edwin J.: *See—*
Adams, Bruce E.; Hensel, Robert D.; and Quinn, Edwin J., 4,145,479, Cl. 428-500.000.
Qurnell, Frank D., to General Electric Company. Corrosion measuring apparatus for radioactive components. 4,145,251, Cl. 176-19.00R.
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Rabinovich, Volf I.; Kriger, Jury N.; Sapozhnikov, Alexandr I.; Svitenko, Igor A.; Sapunov, Viktor E.; Filippov, Vyacheslav V.; and Karpov, Vladimir A., to Venjukovsky Armaturny Zavod. Plant for and method of electroslag remelting of metals and alloys. 4,145,563, Cl. 13-9.0ES.
Rafeld, Karl. Angular corner connecting piece for profiled frame members of multi-sheet insulating glass. 4,145,150, Cl. 403-295.000.
Rainone, Nicholas J., to Westinghouse Electric Corp. Flash lamp array having a positively acting flash sensing indicator. 4,145,730, Cl. 362-10.000.
Rainone, Nicholas J.: *See—*
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Ranco Incorporated: *See—*
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Sunaga, Ryuzoh; and Hasegawa, Kunimi, 4,145,137, Cl. 355-15.000.
Ranninger, Guenther; and Twaroch, Franz, to C. Reichert Optische Werke, AG. Color correcting interference filter. 4,145,113, Cl. 350-166.000.

Rathert, Larry F. Collapsible table and seat assembly. 4,144,823, Cl. 297-159.000.
Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., to Burroughs Corporation. Electrically programmable read-only-memory device. 4,145,702, Cl. 357-45.000.
Raue, Roderich: *See*—
Psaar, Hubertus; and Raue, Roderich, 4,145,537, Cl. 542-465.000.
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RCA Corporation: *See*—
Allen, Richard W.; and Jackson, Alexander, III, 4,145,660, Cl. 328-138.000.
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Conaty, Francis X., 4,145,726, Cl. 360-133.000.
Dholakia, Anil R.; and Alexander, John, 4,145,718, Cl. 358-128.000.
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Freeling, Marvin R.; and Wolkstein, Herbert J., 4,145,691, Cl. 343-7.0AG.
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Peters, Kenneth D.; and Anderson, Charles H., 4,145,633, Cl. 313-422.000.
Upadhyayula, Lakshminarasimha C., 4,145,624, Cl. 307-299.00R.
Willis, Donald H., 4,145,639, Cl. 315-411.000.
Rea, Levoy B. Wheel chock. 4,144,951, Cl. 188-32.000.
Read, Marjorie S.: *See*—
Brinkhous, Kenneth M.; and Read, Marjorie S., 4,145,185, Cl. 23-230.00B.
Read, Martin A., to Lucas Industries Limited. Gas flow transducers and I.C. engine control systems incorporating such transducers. 4,144,750, Cl. 73-194.00F.
Reale, Salvatore. Combination hoist and mount. 4,144,973, Cl. 212-8.00R.
Recognition Equipment Incorporated: *See*—
McMurray, Robert D.; and Hicks, James R., 4,145,686, Cl. 340-347.0DD.
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Remedi, James J., to Motorola, Inc. Virtual power supply ROM. 4,145,759, Cl. 365-203.000.
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Repplinger, Thomas J., to Otto Engineering, Inc. Actuation for sequentially operating plural switches. 4,145,590, Cl. 200-330.000.
Research Corporation: *See*—
Beemsterboer, George L.; and Satanek, Joseph, Jr., 4,145,345, Cl. 260-239.30T.
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Restori, Ettore; and Careglio, Giuseppe, to WABCO Westinghouse. Arrangement for providing auxiliary energy source for static inverter used with traction motor drive during power interruption. 4,145,618, Cl. 307-64.000.
Restori, Ettore: *See*—
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Reynolds, Howard R. Adjustable broiler convection oven. 4,144,870, Cl. 126-41.00E.
Rheinische Braunkohlenwerke Aktiengesellschaft: *See*—
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Rhone-Poulenc Industries: *See*—
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Barreau, Michel; Cotrel, Claude; and Jeanmart, Claude, 4,145,423, Cl. 424-251.000.
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Richter, Martin; and Entner, Josef, to Hilti Aktiengesellschaft. Expansion dowell assembly with setting control. 4,144,796, Cl. 85-61.000.
Ridyard, Denis R. A., to Imperial Chemical Industries Limited. Water-soluble reactive monoazo dye containing a nonylphenoxy, chlorotriazine group. 4,145,340, Cl. 260-153.000.
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Rinard, George A.; Rugg, Donald E.; and Steffen, Dale A., to Colorado Seminary. Method and apparatus for monitoring the position of the eye. 4,145,122, Cl. 351-7.000.
Ripingill, Allen E., Jr. Hand-held logic circuit probe. 4,145,651, Cl. 324-72.500.
Ritter, Lester L. Directional impact tool for tunneling. 4,144,941, Cl. 175-19.000.
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Day, Edward A.; Seay, Glenn E.; and Ritter, Perry B., 4,144,814, Cl. 102-28.00R.
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Roberts, Kent S.; and Roberts, Brent J., to Roberts Mfg., Inc. Folding leg mechanism. 4,144,822, Cl. 108-129.000.
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Roberts, Michael G.; and Bolen, Charles E., to Owens-Corning Fiberglas Corporation. Thermoplastic graft copolymers. 4,145,381, Cl. 260-880.00R.
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Robertshaw Controls Company: *See*—
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Tseng, James W., 4,145,619, Cl. 307-118.000.
Robertson, Larry L. Livestock gate. 4,145,032, Cl. 256-73.000.
Robinson, John W.; and Dietrich, Ralph N., to Kimball International, Inc. Keyer circuit for electronic organ. 4,144,787, Cl. 84-1.010.
Robinson, Peter M.; Coville, Michael W. C.; and Dexter, Robin W., to American Cyanamid Company. Aqueous free-radical polymerization using redox system initiator that avoids adverse effects of polymerization inhibiting cations. 4,145,495, Cl. 526-93.000.
Robson, Harry E., to Exxon Research & Engineering Co. Preparation of catalysts of predetermined pore size distribution and pore volume. 4,145,316, Cl. 252-465.000.
Rockwell International Corporation: *See*—
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Rodewald, Paul G., to Mobil Oil Corporation. Silica-modified zeolite catalyst. 4,145,315, Cl. 252-455.00Z.
Rodier, Henry, to Rhone Poulenc Textile. Cellulose fiber process. 4,145,391, Cl. 264-83.000.
Rodrigue, Luc W.: *See*—
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Roney, John E., to Jones & Laughlin Steel Corporation. Radiation measurement of a product temperature in a furnace. 4,144,758, Cl. 73-355.00R.

Roos, Ernst: *See*—
Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, 4,145,512, Cl. 528-73.000.

Rose, David, to Henkel Kommanditgesellschaft auf Aktien. Method for the production of 5-nitroso-2,4,6-triaminopyrimidine. 4,145,548, Cl. 544-323.000.

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Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans J., 4,145,507, Cl. 528-25.000.

Rosenthal, Louis A., to Union Carbide Corporation. Method for the surface treatment of thermoplastic materials. 4,145,386, Cl. 264-22.000.

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Rossi, Louis J.: *See*—
Ford, John A., Jr.; Rossi, Louis J.; and Santilli, Domenic, 4,145,299, Cl. 252-62.10L.

Rothenberger GmbH & Co.: *See*—
Rothenberger, Gunter, 4,144,735, Cl. 72-393.000.

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Rowlands, David A.; and Taylor, John B., 4,145,419, Cl. 424-248.400.

Rowe, Englebert L.: *See*—
Fitch, Kandy A.; and Rowe, Englebert L., 4,145,440, Cl. 424-287.000.

Rowlands, David A.; and Taylor, John B., to Roussel Uclaf. Novel imidazobenzoxazines. 4,145,419, Cl. 424-248.400.

Royer, Joel H., to B&B Electrical Manufacturing Co. Inc. Roller belt controls. 4,145,728, Cl. 361-23.000.

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Podkopaev, Boris I.; Klunko, Ivan F.; Kiry, Grigory S.; Ocheretko, Vyacheslav V.; Rozhdestvensky, Lev I.; and Chervyakova, Ljudmila D., 4,144,656, Cl. 35-9.00A.

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Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans J., 4,145,507, Cl. 528-25.000.

Ruga, Wayne. Angle plate connector for tubular members. 4,145,149, Cl. 403-217.000.

Rugg, Donald E.: *See*—
Rinard, George A.; Rugg, Donald E.; and Steffen, Dale A., 4,145,122, Cl. 351-7.000.

Russell, Homer C.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,742, Cl. 364-709.000.
Olander, Emil E., Jr.; James, Rex J.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,752, Cl. 364-709.000.

Russell, Robert G., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming kinky fibers from heat-softenable material. 4,145,199, Cl. 65-2.000.

Ryan, Donald J., to Du Pont de Nemours, E. I., and Company. Chlorination or chlorosulfonation of polyethylene in mixed solvent. 4,145,491, Cl. 526-31.000.

Rysti, Alpo. Method and apparatus for providing lumber stacks with stickers. 4,144,976, Cl. 414-42.000.

S.A.E.S. Getters S.p.A.: *See*—
Schiabel, Antonio, 4,145,162, Cl. 417-48.000.

Saab-Scania Aktiebolag: *See*—
Hansson, Hans; and Karling, Krister, 4,145,111, Cl. 350-97.000.

Sadamasa, Tetsuo; Naito, Makoto; and Nakamura, Tadao, to Tokyo Shibaura Electric Co., Ltd. Semiconductor luminescent display apparatus. 4,145,707, Cl. 357-68.000.

Sado, Ryoichi; and Tahara, Kazutoki, to Shin-Etsu Polymer Co., Ltd. Pressure-sensitive resistance elements. 4,145,317, Cl. 252-512.000.

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Uemura, Hiroki; and Saeki, Yoshifumi, 4,145,716, Cl. 358-118.000.

Saenger, Leif H.; and Danielsen, Per R., to Norlux A/S. Switchable sign. 4,144,663, Cl. 40-406.000.

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Porta, Paolo D.; Cantaluppi, Angelo; Ferrario, Bruno; and Montalenti, Paolo, 4,145,355, Cl. 260-348.340.

Safe-T-Lawn, Inc.: *See*—
Harrison, Richard J.; Muschett, William G.; and Hardy, Charles T., 4,145,003, Cl. 239-288.000.

Saint-Gobain Industries: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,145,203, Cl. 65-16.000.
Mercier, Alain; and Fournier, Yves, 4,145,237, Cl. 156-107.000.
Mucha, Horst; Arnoldi, Wilhelm; Fattler, Kurt; Overath, Albrecht; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; and Audi, Josef, 4,145,723, Cl. 360-79.000.
Pelzer, Rudolf; and Scholl, Heinz, 4,145,173, Cl. 425-224.000.

Saito, Masumi: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Taniguchi, Yoshiko; Saito, Masumi; and Sakata, Ryozo, 4,145,318, Cl. 521-112.000.

Saito, Nobuo: *See*—
Yoshizawa, Shigeru; Sugita, Yutaka; Saito, Nobuo; Arai, Yuji; and Yamaguchi, Nakahiko, 4,145,750, Cl. 365-6.000.

Saito, Sozo, to Kondo Sylvania Kabushiki Kaisha. Incandescent lamp. 4,145,631, Cl. 313-315.000.

Saka, Tatsuo: *See*—
Mizukawa, Takumi; Amagami, Keizo; Kiuchi, Mitsuyuki; Yoshida, Hirokazu; and Saka, Tatsuo, 4,145,592, Cl. 219-10.49R.

Sakai, Keiziro: *See*—
Omae, Tsutomu; Shibata, Takanori; Sakai, Keiziro; Iizuka, Tomio; and Koyama, Takaichi, 4,144,992, Cl. 228-102.000.

Sakaki, Hiroshi; and Shintani, Sotokichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Method for establishing a tap coefficient of an adaptive automatic equalizer. 4,145,747, Cl. 364-724.000.

Sakakibara, Yukio: *See*—
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, 4,145,608, Cl. 250-231.0SE.

Sakamoto, Eiichi: *See*—
Habu, Teiji; Nakano, Masashi; Tsuda, Yasuo; Sakamoto, Eiichi; and Yamada, Hiroshi, 4,145,218, Cl. 96-66.300.

Sakamoto, Masakatsu; Uchida, Kenji; and Honma, Isao, to Hitachi, Ltd. System for hydraulically transporting solid material. 4,145,087, Cl. 302-14.000.

Sakata, Ryozo: *See*—
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Taniguchi, Yoshiko; Saito, Masumi; and Sakata, Ryozo, 4,145,318, Cl. 521-112.000.

Sako, Junichi; Honda, Norimasa; Tokunaga, Hideo; Hoshino, Toshiro; and Kai, Shin-ichiro, to Daikin Kogyo Co., Ltd. Paste extrusion of PTFE. 4,145,385, Cl. 264-22.000.

Sakura Color Products Corporation: *See*—
Fukuoka, Mitsuhiro, 4,145,148, Cl. 401-209.000.

Sakurada, Nobuaki: *See*—
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Murakami, Hiroyasu; and Ito, Tadashi, 4,145,129, Cl. 354-23.00D.

Sakurai, Masaaki; and Ishida, Masato, to Canon Kabushiki Kaisha. Fixing device of electrophotographic copying machine. 4,145,599, Cl. 219-216.000.

Sakurai, Yoshio: *See*—
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.

Salatiello, Peter P.: *See*—
Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,145,502, Cl. 526-255.000.

Salger, Werner, to Fa. Lumoprint Zindler KG (GmbH & Co.). Feeding device for supplying developer powder to a magnetic drum. 4,144,839, Cl. 118-658.000.

Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Safety binding for ski-boot with automatic refitting. 4,145,071, Cl. 280-624.000.

Samuel Moore and Company: *See*—
Snow, John P., 4,145,076, Cl. 285-94.000.

Samuelson, Harry V.; and Smiley, Dean H., to Du Pont de Nemours, E. I., and Company. Antistatic filament having a polymeric sheath and a conductive polymeric core. 4,145,473, Cl. 428-373.000.

Samuelsson, Benny R.: *See*—
Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., 4,145,442, Cl. 424-330.000.

Sanderson, Frank T.; and Zdanowski, Richard E., to Rohm and Haas Company. Backing-free massive thickness pressure sensitive adhesive sheet and bonding rigid objects to larger surfaces. 4,145,465, Cl. 428-31.000.

Sandoz Ltd.: *See*—
Neumann, Peter, 4,145,421, Cl. 424-250.000.
Stadler, Paul, 4,145,549, Cl. 544-346.000.

Sandvik Aktiebolag: *See*—
Nystrom, Lars I.; and Lagerstrom, Bengt, 4,144,777, Cl. 76-112.000.

Sandvik Aktiebolg: *See*—
Oskarsson, Rolf G.; and Ekemar, Carl S. G., 4,145,213, Cl. 75-238.000.

Sandvik Conveyor GmbH: *See*—
Schermutzki, Konrad; and Braun, Erhard, 4,145,170, Cl. 425-101.000.

Santilli, Domenic: *See*—
Ford, John A., Jr.; Rossi, Louis J.; and Santilli, Domenic, 4,145,299, Cl. 252-62.10L.

Sapozhnikov, Alexandr I.: *See*—
Rabinovich, Volf I.; Kriger, Jury N.; Sapozhnikov, Alexandr I.; Svitenko, Igor A.; Sapunov, Viktor E.; Filippov, Vyacheslav V.; and Karpov, Vladimir A., 4,145,563, Cl. 13-9.0ES.

Sapunov, Viktor E.: *See*—
Rabinovich, Volf I.; Kriger, Jury N.; Sapozhnikov, Alexandr I.; Svitenko, Igor A.; Sapunov, Viktor E.; Filippov, Vyacheslav V.; and Karpov, Vladimir A., 4,145,563, Cl. 13-9.0ES.

Sara, George M., to Beach Manufacturing Corporation. Lithographic plate processor. 4,145,135, Cl. 354-317.000.

Sarradin, Joel: *See*—
Bonnemay, Maurice; Bronoel, Guy; Maximovitch nee Fabre, Suzanne; and Sarradin, Joel, 4,145,483, Cl. 429-103.000.

Sasaki, Mitsuo: *See*—
Kuwabara, Masamichi; Sasaki, Mitsuo; Uema, Sigeru; Taniguchi, Youkichi; Fukuchi, Noboru; and Kimura, Tohru, 4,145,462, Cl. 427-160.000.

Sasakura Engineering Company, Limited: *See*—
Takada, Masaharu, 4,145,245, Cl. 159-13.00B.

Sasse, Klaus: *See*—
Schulze, Andreas; Sasse, Klaus; Naumann, Klaus; Roessler, Peter; and Kraus, Peter, 4,145,439, Cl. 424-285.000.

Satanek, Joseph, Jr.: *See*—
Beemsterboer, George L.; and Satanek, Joseph, Jr., 4,145,345, Cl. 260-239.30T.

Sato, Akihiko. Physiologically active substances and the isolation thereof. 4,145,415, Cl. 424-195.000.

Sato, Masao: *See*—
Shida, Seiya; Fushimi, Shigeo; and Sato, Masao, 4,145,575, Cl. 179-15.0FD.

Sato, Yo, to Kabushiki Kaisha Sato. Code plate device for a labeling machine. 4,144,809, Cl. 101-288.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Portable label printing-dispensing machine. 4,144,810, Cl. 101-292.000.

Sato, Yoshinari, to Fujisawa Pharmaceutical Co., Ltd. 6 Acyloryalkyl-1,4-dihydropyridine derivatives and a method of effecting vasodilation therewith. 4,145,432, Cl. 424-266.000.

Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., to Cities Service Company. Defoamer for high strength acid media. 4,145,309, Cl. 252-358.000.

Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., to Cities Service Company. Defoamer for high strength acid media. 4,145,310, Cl. 252-358.000.

Saunders, Arthur G.: *See*—
Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., 4,145,241, Cl. 156-305.000.

Saunders, George D. Sectional multi-purpose cargo container. 4,144,984, Cl. 220-1.500.

Sawhney, Dulari L.: *See*—
Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,145,502, Cl. 526-255.000.

Schaechter, Alan L. Method of retaining a pillow in a pillow case. 4,144,603, Cl. 5-339.000.

Schaeffer, Daniel M. Line tensioning apparatus and method. 4,144,620, Cl. 24-71.300.

Schaeffer, Georg: *See*—
Topp, Alwin; Schmiedel, Klaus; and Schaeffer, Georg, 4,145,283, Cl. 210-63.00R.

Schaevitz Engineering: *See*—
Hartzell, Robert E., Jr., 4,144,764, Cl. 73-497.000.

Schafer, Heinrich, to Thyssen Industrie Aktiengesellschaft. Transmission for a two-worm press with counter running worms. 4,144,775, Cl. 74-665.0GA.

Schenk, Norbert; Losacker, Paul; and Martin, Manfred, to Bayer Aktiengesellschaft. Process for removing 1,4-naphthoquinone from phthalic anhydride. 4,145,353, Cl. 260-346.700.

Schering, A.G.: *See*—
Lachnit-Fixson, Ursula; and Neumann, Friedmund, 4,145,416, Cl. 424-238.000.

Schermutzki, Konrad; and Braun, Erhard, to Sandvik Conveyor GmbH. Apparatus for producing sheets of thermoplastic material. 4,145,170, Cl. 425-101.000.

Schiabel, Antonio, to S.A.E.S. Getters S.p.A. Getter device and method of use. 4,145,162, Cl. 417-48.000.

Schick, Jean-Francois. Method and device for fixing joining clamps on a conveyor band, belt or the like. 4,144,628, Cl. 29-243.510.

Schick, Lloyd A.; and Carpenter, Stephen K., to Miles Laboratories, Inc. Specific binding - adsorbent assay method and test means. 4,145,406, Cl. 424-1.000.

Schiele, Werner: *See*—
Bertling, Johannes-Gerhard; and Schiele, Werner, 4,144,858, Cl. 123-139.0AW.

Schiller, Julian G.: *See*—
United States of America, National Aeronautics and Space Administration; Schiller, Julian G.; and Liu, Chung C., 4,145,255, Cl. 195-103.50R.

Schiminski, Herbert: *See*—
Turk, Herbert; and Schiminski, Herbert, 4,145,010, Cl. 242-18.00A.

Schingnitz, Manfred: *See*—
Beise, Hans; Schlicht, Burkhard; Thiele, Manfred; Gross, Manfred; Minak, Hans-Peter; Schingnitz, Manfred; Wehner, Klaus; and Burk, Werner, 4,145,192, Cl. 55-32.000.

Schisselbauer, John C.: *See*—
Auchinleck, Richard J.; Schisselbauer, John C.; Garczynski, John S.; Jablanofsky, Charles C.; and Dobson, Charles J., 4,145,606, Cl. 235-477.000.

Schlicht, Burkhard: *See*—
Beise, Hans; Schlicht, Burkhard; Thiele, Manfred; Gross, Manfred; Minak, Hans-Peter; Schingnitz, Manfred; Wehner, Klaus; and Burk, Werner, 4,145,192, Cl. 55-32.000.

Schlichting, Karl: *See*—
Sterzel, Hans-Josef; Schlichting, Karl; and Seydl, Wolfgang, 4,145,331, Cl. 260-40.00R.

Schlising, Anton E. Access limiting bird feeder. 4,144,842, Cl. 119-52.00R.

Schlueter, Gert; and Schuster, Wilheim, to Battelle-Institut e.V. Method and implement to take and collect sample material, especially for scientific or diagnostic examination. 4,144,760, Cl. 73-425.000.

Schmid, Gerold E.: *See*—
Price, Lester A.; Schmid, Gerold E.; and Millonzi, Lawrence A., 4,145,645, Cl. 318-762.000.

Schmidt, Dieter K.; and Buschor, Josef J., to New Century Beverage Company. Machine for testing bottles. 4,144,742, Cl. 73-37.000.

Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, to Dr. Beck & Co., A.G. Polyester imide resins. 4,145,334, Cl. 528-189.000.

Schmidt, Karl; Hansch, Ferdinand; and Rombrecht, Hans-Malte, to Dr. Beck & Co. AG. Diimidodicarboxylic acids. 4,145,351, Cl. 260-326.00N.

Schmidt, Otto K.; and Taylor, Robert P., to AMF Incorporated. Reconstituted tobacco composition and process for manufacturing same. 4,144,894, Cl. 131-17.0AC.

Schmiedel, Klaus: *See*—
Topp, Alwin; Schmiedel, Klaus; and Schaeffer, Georg, 4,145,283, Cl. 210-63.00R.

Schneider, Hans K. Clamping device for a dental tool. 4,145,061, Cl. 279-96.000.

Scholl, Charles H.: *See*—
Akers, Larry D.; Scholl, Charles H.; Smith, Joseph S.; and Williams, Edward A., 4,144,913, Cl. 141-2.000.

Scholl, Heinz: *See*—
Pelzer, Rudolf; and Scholl, Heinz, 4,145,173, Cl. 425-224.000.

Schott, Charles M., Jr., to Gloucester Engineering Co., Inc. Air cooling ring for plastic film with independent lubricating air for film guide surface. 4,145,177, Cl. 425-445.000.

Schrougham, Benton. Self-locking anchor stake. 4,144,843, Cl. 119-121.000.

Schuck, Joseph T. Dispensing oral hygiene apparatus with vented material chamber. 4,145,147, Cl. 401-175.000.

Schulze, Andreas; Sasse, Klaus; Naumann, Klaus; Roessler, Peter; and Kraus, Peter, to Bayer Aktiengesellschaft. Combating pests with benzyl phenyl ethers. 4,145,439, Cl. 424-285.000.

Schundehutte, Karl H.: *See*—
Trautner, Kersten; and Schundehutte, Karl H., 4,145,342, Cl. 260-207.000.

Schuster, Hans-Dieter: *See*—
Abthoff, Jorg; and Schuster, Hans-Dieter, 4,145,394, Cl. 422-179.000.

Schuster, Wilheim: *See*—
Schlueter, Gert; and Schuster, Wilheim, 4,144,760, Cl. 73-425.000.

Schutte, Richard W.: *See*—
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Schwarz, Peter: *See*—
Croce, Piero D.; Pellizzon, Tullio; Schwarz, Peter; and Piccolo, Luigi, 4,145,228, Cl. 106-304.000.

SCM Corporation: *See*—
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Scott Paper Company: *See*—
McConnell, Albert L.; and Schutte, Richard W., 4,145,464, Cl. 428-171.000.

Scourtes, George, to Allen Group, Inc., The. Apparatus and methods for automatically transferring articles from a continuously movable conveyor to a work station. 4,144,960, Cl. 198-339.000.

Scovill Manufacturing Company: *See*—
Dziura, Walter H.; and Kendall, Robert B., 4,144,738, Cl. 72-410.000.

Scripps Clinic and Research Foundation: *See*—
Edgington, Thomas S.; and Plow, Edward F., 4,145,336, Cl. 260-112.00R.

Seal Incorporated: *See*—
Merrill, Richard E.; and Krueger, Theodore H., 4,145,216, Cl. 96-28.000.

Seaquist Valve Company: *See*—
Kirkel, David, 4,145,005, Cl. 239-573.000.

Sears, Barry D. Method of preparing a controlled-release pharmaceutical preparation, and resulting composition. 4,145,410, Cl. 424-19.000.

Seay, Glenn E.: *See*—
Day, Edward A.; Seay, Glenn E.; and Ritter, Perry B., 4,144,814, Cl. 102-28.00R.

Seeberg, Horst: *See*—
Grewe, Heinz-Gunther; Seeberg, Horst; Fach, Horst; and Isermann, Friedrich, 4,145,257, Cl. 202-241.000.

Sefick, Stephen A.; and Jones, Robert K., to NCR Corporation. Method for making narrow channel FET by masking and ion-implantation. 4,145,233, Cl. 148-1.500.

Segal, Leon; and Steinberg, Albert H., to Allied Chemical Corporation. Fibrous dispersion aid for thermoplastics. 4,145,227, Cl. 106-288.00B.

Segawa, Takashi, to Shimano Industrial Company Limited. Hub with free wheel for a bicycle. 4,145,095, Cl. 308-192.000.

Sehnert, Robert J.: *See*—
Bione, Angelo A.; Sehnert, Robert J.; and Taylor, Horace E., 4,144,788, Cl. 84-1.010.

Seib, Karl: *See*—
Krapf, Heinz; Oppenlaender, Knut; and Seib, Karl, 4,145,307, Cl. 252-309.000.

Seidler, Don W.: *See—*
Weyenberg, Robert J.; and Seidler, Don W., 4,145,001, Cl. 239-56.000.
Seiko Koki Kabushiki Kaisha: *See—*
Onda, Eiichi; Koyama, Mitsuo; Nakagawa, Tadashi; Watanabe, Masanori; and Nemoto, Ichiro, 4,145,132, Cl. 354-249.000.
Seilly, Alec H., to Simms Group Research & Development Limited. Electro-magnetic devices. 4,145,625, Cl. 310-27.000.
Seiz, Wolfgang: *See—*
Eldin, Sameer H.; Seiz, Wolfgang; and Forster, Ewald, 4,145,247, Cl. 162-136.000.
Sekerich, Michael, to Buildex, Inc. Ball bearing roller assembly. 4,145,093, Cl. 308-3.800.
Seki, Kunio, to Hitachi, Ltd. Multistage amplifier circuit. 4,145,666, Cl. 330-265.000.
Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Aqueous coatings based on epoxy ester copolymers. 4,145,323, Cl. 260-29.300.
Selby, Howard W., III, to Pure Cycle Corporation. Water recycling system. 4,145,279, Cl. 210-17.000.
Selcer, William H.: *See—*
Hirsch, Richard H.; and Selcer, William H., 4,145,556, Cl. 560-75.000.
Semionics Associates: *See—*
Lamb, Sydney M.; and Hurt, David B., 4,145,737, Cl. 364-200.000.
Sequeira, Avilino, Jr.: *See—*
Mead, Theodore C.; Sequeira, Avilino, Jr.; and Odell, Norman R., 4,145,273, Cl. 208-3.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Device for folding the head portions of inner wrappers in a machine for packeting cigarettes into hinged-lid type packets. 4,144,695, Cl. 53-234.000.
Serel Corporation: *See—*
Dice, Charles A., 4,145,620, Cl. 307-149.000.
Sergay, Dimitry B. Power steering system. 4,144,948, Cl. 180-148.000.
Seroussi, Henry I. Aeration and filtration pump for aquariums. 4,145,289, Cl. 210-169.000.
Seto, Tetsuhiko: *See—*
Nakata, Jyoichi; Chiba, Yasumasa; Seto, Tetsuhiko; and Fukuhara, Yoshinori, 4,145,265, Cl. 204-98.000.
Seydl, Wolfgang: *See—*
Sterzel, Hans-Josef; Schlichting, Karl; and Seydl, Wolfgang, 4,145,331, Cl. 260-40.00R.
Shafer Valve Company: *See—*
Covington, Morris T.; and Griffin, Steven M., 4,144,743, Cl. 73-40.50R.
Shah, Raj: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,145,323, Cl. 260-29.300.
Shakespeare Marine Electronics, Inc.: *See—*
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Shapiro, Aron B.: *See—*
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Sharkey, William H.: *See—*
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Shaw, David H.: *See—*
Hall, Ralph R.; and Shaw, David H., 4,145,275, Cl. 208-33.000.
Shaw, Pern: *See—*
Gunter, Thomas G.; Musa, Fuad H.; Shaw, Pern; and Wiles, Michael F., 4,145,761, Cl. 365-227.000.
Shearin, Nadeane P. Emergency exit step for school bus. 4,145,066, Cl. 280-166.000.
Shell Oil Company: *See—*
Gatti, Anthony R.; Hokanson, James S.; and Nozaki, Kenzie, 4,145,297, Cl. 252-25.000.
Shelton, George E., to Younger, Lloyd, a part interest. Stubble flattener attachment. 4,144,698, Cl. 56-1.000.
Shelton, Kenneth. Disposable food tray and container system. 4,144,968, Cl. 206-509.000.
Sheng, Tan T.: *See—*
Chang, Chuan C.; Chang, Robert P. H.; Coleman, James J.; and Sheng, Tan T., 4,144,634, Cl. 29-571.000.
Shenoy, Umakant D., to DDSA Pharmaceuticlas Ltd. Benzodiazepines. 4,145,417, Cl. 424-244.000.
Shepherd, David; and Carels, Mariette S. C., to Societe d'Assistance Technique pour Produits Nestle S.A. Red pigment production. 4,145,254, Cl. 195-81.000.
Sheridan, John J., Jr.: *See—*
Simoneau, E. Thomas; and Sheridan, John J., Jr., 4,145,308, Cl. 252-321.000.
Sherosky, Frank: *See—*
Craven, Lawrence C.; and Sherosky, Frank, 4,144,967, Cl. 206-229.000.
Shibata, Takanori: *See—*
Omae, Tsutomu; Shibata, Takanori; Sakai, Keiziro; Iizuka, Tomio; and Koyama, Takaichi, 4,144,992, Cl. 228-102.000.
Shida, Seiya; Fushimi, Shigeo; and Sato, Masao, to Nippon Electric Co., Ltd. Frequency-division multiplexed signal transmission system. 4,145,575, Cl. 179-15.0FD.
Shima, Tsukasa: *See—*
Mizoguchi, Takahisa; Henmi, Hiroshi; Shima, Tsukasa; Yamashita, Yasuhiko; Uematsu, Shinichi; and Kawamura, Kazuo, 4,145,468, Cl. 428-239.000.
Shimabara, Yoichi: *See—*
Yabuta, Keiichiro; Marumo, Nagayuki; Shimabara, Yoichi; Ishigaki, Masahiro; Ishihara, Ken; and Mayama, Yoshiki, 4,144,921, Cl. 152-353.00R.
Shimadzu Seisakusho Ltd.: *See—*
Nakamura, Kengi; and Yamamoto, Hiroshi, 4,145,139, Cl. 356-73.000.
Shimano Industrial Company Limited: *See—*
Noda, Hideo, 4,145,015, Cl. 242-84.20A.
Segawa, Takashi, 4,145,095, Cl. 308-192.000.
Shimizu, Kazuyuki: *See—*
Inoue, Koichi; Nonogaki, Hajime; Urakawa, Tatsuo; and Shimizu, Kazuyuki, 4,145,738, Cl. 364-200.000.
Shimizu, Masami; Aizawa, Hiroshi; Yamamichi, Masayoshi; Iura, Yukio; Uchidoi, Masanori; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Current supply release system for magnetic mechanism. 4,145,130, Cl. 354-51.000.
Shimizu, Shohachi: *See—*
Yamada, Akio; and Shimizu, Shohachi, 4,145,159, Cl. 407-53.000.
Shin-Etsu Polymer Co., Ltd.: *See—*
Sado, Ryoichi; and Tahara, Kazutoki, 4,145,317, Cl. 252-512.000.
Shindo, Minoru: *See—*
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,145,357, Cl. 260-397.200.
Shindo, Noboru: *See—*
Takai, Isao; and Shindo, Noboru, 4,144,700, Cl. 57-264.000.
Takai, Isao; and Shindo, Noboru, 4,144,701, Cl. 57-336.000.
Shinoda, Nobuhiko: *See—*
Kawamura, Masaharu; Sakurada, Nobuaki; Shinoda, Nobuhiko; Murakami, Hiroyasu; and Ito, Tadashi, 4,145,129, Cl. 354-23.00D.
Shintani, Sotokichi: *See—*
Sakaki, Hiroshi; and Shintani, Sotokichi, 4,145,747, Cl. 364-724.000.
Shioyama, Giichi: *See—*
Maruoka, Hiroyuki; and Shioyama, Giichi, 4,144,853, Cl. 123-117.00R.
Shipman, William H.: *See—*
Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., 4,145,484, Cl. 429-105.000.
Shirahata, Kunikatsu: *See—*
Iida, Takao; Shirahata, Kunikatsu; Maisubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,145,253, Cl. 195-96.000.
Shiraishi, Yasuo: *See—*
Hamazaki, Yasuhiko; Kawabata, Shozo; Yamamoto, Toshiyuki; Shiraishi, Yasuo; and Ueno, Akira, 4,145,444, Cl. 424-331.000.
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, to Nippondenso Co., Ltd. Rotational reference position detecting apparatus. 4,145,608, Cl. 250-231.0SE.
Shkoda, Gennady V.: *See—*
Aroshidze, Jury V.; Iogansen, Vadim I.; Kadi-ogly, Ibragim A.; Petrov, Jury V.; Ptakul, Izrail A.; Romanov, Vasily V.; Sudarikov, Vasily L.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; and Shkoda, Gennady V., 4,145,626, Cl. 310-91.000.
Shmarian, Evgeny M.: *See—*
Sidorovich, Vladimir G.; Dokukin, Alexandr V.; Shmarian, Evgeny M.; Kazakov, Vladimir V.; and Lepikhov, Alexandr I., 4,145,744, Cl. 364-554.000.
Shows, William H. Record disc dewarping device. 4,145,169, Cl. 425-11.000.
Sickert, Richard G.: *See—*
MacFarlane, Thomas R.; and Sickert, Richard G., 4,144,596, Cl. 4-166.000.
Sidorovich, Vladimir G.; Dokukin, Alexandr V.; Shmarian, Evgeny M.; Kazakov, Vladimir V.; and Lepikhov, Alexandr I., to Institut Gornogo Dela Imeni A.A. Skochinskogo. Statistical analyzer of working process parameters of machinery. 4,145,744, Cl. 364-554.000.
Siegl, Walter O., to Ford Motor Company. Organometallic polymers (A). 4,145,523, Cl. 528-395.000.
Siemens Aktiengesellschaft: *See—*
Bromer, Gunter; and Kanzler, Wolfgang, 4,144,780, Cl. 83-71.000.
Hanni, Manfred, 4,145,657, Cl. 325-32.000.
Hofmann, Ruediger; and von Basse, Paul-Werner, 4,145,622, Cl. 307-270.000.
Kersten, Ralf, 4,145,457, Cl. 427-38.000.
Maringer, Albert; and Otte, Hans-Henning, 4,144,746, Cl. 73-117.200.
Poppinger, Herbert; and Tendulkar, Gautam, 4,145,650, Cl. 323-17.000.
Utecht, Manfred, 4,145,019, Cl. 267-121.000.
Wintzer, Klaus, 4,145,574, Cl. 179-15.00A.
Silverman, Allen B.; and Collins, Donald O. Device for and method of removably securing a harness to a musical instrument. 4,144,794, Cl. 84-327.000.
Silverman, Daniel. Bit positioning while drilling system. 4,144,949, Cl. 181-106.000.
Simms Group Research & Development Limited: *See—*
Seilly, Alec H., 4,145,625, Cl. 310-27.000.
Simon, Hans J.: *See—*
Feltgen, Karlheinz; Kaluza, Hans J.; Muschelknautz, Edgar; and Simon, Hans J., 4,145,520, Cl. 528-323.000.
Simone, Anthony D.: *See—*
Martin, William G.; and Simone, Anthony D., 4,145,285, Cl. 210-100.000.
Simoneau, E. Thomas; and Sheridan, John J., Jr., to General Electric

Company. Anti-foam silicone emulsion, and preparation and use thereof. 4,145,308, Cl. 252-321.000.
Singer Company, The: *See—*
Brown, Jack, 4,144,827, Cl. 112-158.00E.
Sipler Plastics, Inc.: *See—*
Stroupe, James D., 4,144,632, Cl. 29-469.500.
Sironi, Giuseppe: *See—*
Ferrero, Francesco; Sironi, Giuseppe; and Viviani, Bruno, 4,145,229, Cl. 106-304.000.
Sitsen, Heinz; and Goppold, Otto, to U.S. Philips Corporation. Dual pivoting panel closure. 4,145,096, Cl. 312-7.0TV.
Sivaramakrishnan, Parameswar: *See—*
Baron, Arthur L.; and Sivaramakrishnan, Parameswar, 4,145,373, Cl. 260-873.000.
Sivill, Alistair D., to Lucas Industries Limited. Viscometer. 4,144,745, Cl. 73-59.000.
Sjostrand, Sven E.: *See—*
Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., 4,145,442, Cl. 424-330.000.
Skimovex B.V.: *See—*
Middelbeek, Cornelis G.; Polano, Machiel E.; and Wolters, Tjako A., 4,145,280, Cl. 210-20.000.
Skinner, David R., to Standard Oil Company (Indiana). Speed control. 4,145,161, Cl. 417-22.000.
Skogsagarnas Vanerindustrier Aktiebolag: *See—*
Lindstrom, Nils E., 4,144,782, Cl. 83-102.100.
Skwirut, Henry: *See—*
Evans, George S.; and Skwirut, Henry, 4,145,634, Cl. 313-490.000.
Skyline Parts, Inc.: *See—*
Williams, Ronald L.; and McKeen, Robert G., 4,144,719, Cl. 62-239.000.
Sletten, Carlyle J. Compact, directive, broadband antenna system having end loaded dipoles. 4,145,694, Cl. 343-727.000.
Sloan, Cephas H.: *See—*
Morie, Gerald P.; Sloan, Cephas H.; Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,145,518, Cl. 528-272.000.
Slowik, Alfred A. Automatic pulverized coal sampler. 4,144,759, Cl. 73-422.00R.
Smetz, Reinhard: *See—*
Dalferth, Hans; and Smetz, Reinhard, 4,144,709, Cl. 59-93.000.
Smiley, Dean H.: *See—*
Samuelson, Harry V.; and Smiley, Dean H., 4,145,473, Cl. 428-373.000.
Smiley, Leonard H., to Rohm and Haas Company. Rigidized acrylic articles and method. 4,145,477, Cl. 428-441.000.
Smith, Fergus S.; and Arch, David I. Snow-making nozzle assembly. 4,145,000, Cl. 239-14.000.
Smith International, Inc.: *See—*
Evans, Robert F., 4,144,936, Cl. 166-298.000.
Vezirian, Edward, 4,145,094, Cl. 308-8.200.
Smith, Joseph S.: *See—*
Akers, Larry D.; Scholl, Charles H.; Smith, Joseph S.; and Williams, Edward A., 4,144,913, Cl. 141-2.000.
Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas H.; Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,145,546, Cl. 544-310.000.
Smith, Ray F.: *See—*
Smith, Ray V.; Smith, Ray F.; Brizendine, Wesley D.; and Boatman, Robert L., 4,144,986, Cl. 222-52.000.
Smith, Ray V.; Smith, Ray F.; Brizendine, Wesley D.; and Boatman, Robert L. Hot melt adhesive pumping apparatus having pressure-sensitive feedback control. 4,144,986, Cl. 222-52.000.
Smith, Raymond: *See—*
Moyer, Thomas D.; Smith, Raymond; Urbani, Aldo J.; Greenburg, Harley D.; Hamburg, Glenn W.; Marsh, Francis X.; and Van Huysen, Robert S., 4,144,950, Cl. 184-6.110.
Smith, Richard W., to United States of America, Energy. Acoustic imaging system. 4,145,680, Cl. 340-5.0MP.
Smith, Roy H., Jr.; and Travis, Bobby J., to Travis, Bobby J. Fluid flow rotating machinery of lobe type. 4,145,168, Cl. 418-150.000.
Smith, Teddy V. Process for making extruded panel product. 4,145,389, Cl. 264-40.700.
Sneider, Vincent R. Bag for pets with access openings therein for applying flea killing spray. 4,144,845, Cl. 119-160.000.
Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., to Norfin, Inc. Sheet binding method. 4,145,241, Cl. 156-305.000.
Snow, John P., to Samuel Moore and Company. Connecting member for lubrication system. 4,145,076, Cl. 285-94.000.
Snow, Robert E., to International Minerals & Chemical Corp. Beneficiation of phosphate ore. 4,144,969, Cl. 209-166.000.
Societe Anonyme Automobiles Citroen: *See—*
Mauboussin, Joel, 4,144,757, Cl. 73-308.000.
S.A. des Anciens Etablissements Paul Wurth: *See—*
Kuntziger, Ernest P., 4,145,033, Cl. 266-44.000.
Mahr, Rene N.; and Mailliet, Pierre H., 4,144,902, Cl. 137-246.220.
Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Boujet, Jean-Pierre, 4,145,673, Cl. 333-135.000.
Societe Anonyme dite: Societe des Fabrications Biraghi-Entrepose: *See—*
Pignal, Edmond L., 4,145,596, Cl. 219-98.000.
Societe Anonyme Francaise du Ferodo: *See—*
de Gennes, Gerard, 4,144,957, Cl. 192-98.000.
S.A. P R B en Neerlandais PRB N.V.: *See—*
Brepoels, Joseph R.; and Vaneghem, Jean-Marie, 4,145,362, Cl. 260-465.00G.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Shepherd, David; and Carels, Mariette S. C., 4,145,254, Cl. 195-81.000.
Societe des Acieries de Paris et D'Outreau: *See—*
Guillaumin, Jean-Claude, 4,144,819, Cl. 105-230.000.
Societe des Mines et Fonderies de Zinc de la Vieille Montagne: *See—*
Bodson, Fernand J. J., 4,145,212, Cl. 75-118.00R.
Societe Lannionnaise d'Electronique Sle-Citerel: *See—*
Gueguen, Michel, 4,145,696, Cl. 343-792.500.
Societe Nationale des Poudres et Explosifs: *See—*
Becuwe, Alain G.; and Ucciani, Claude M., 4,145,361, Cl. 260-463.000.
Soga, Hiromu, to Nippon Steel Corporation. Monitor for priority level of task in information processing system. 4,145,735, Cl. 364-200.000.
Soika, Emil H.; and Genc, Robert R. Stringed instrument construction employing an integral, hollow, one piece body portion. 4,144,793, Cl. 84-291.000.
Solbakken, Age, to Energy Conversion Systems Limited. Process for preparing a clean-burning, low sulphur liquid fuel from coal. 4,145,189, Cl. 44-51.000.
Sollish, Bruce D.: *See—*
Frei, Ephraim H.; Sollish, Bruce D.; and Yerushalmi, Shmuel, 4,144,877, Cl. 128-2.00S.
Solomon, Jack, to Union Carbide Corporation. Process for carburizing steel. 4,145,232, Cl. 148-16.500.
Solvay & Cie: *See—*
Vanlautem, Noel; and Gilain, Jacques, 4,145,526, Cl. 528-481.000.
Sony Corporation: *See—*
Yoshinaka, Tadaaki, 4,145,705, Cl. 358-8.000.
Soubie, Pierre J. Bag and flotation buoy. 4,144,607, Cl. 9-339.000.
Sourirajan, Srinvasa: *See—*
Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinvasa, 4,145,295, Cl. 210-500.00M.
Southern Pacific Transportation Company: *See—*
Jaekle, William M.; Byrne, Robert; and Giovanelli, Armand, 4,144,820, Cl. 105-368.00R.
Souza, Anthony J., to Woodstream Corporation. Self-locking disposable rodent trap. 4,144,667, Cl. 43-61.000.
Spain, Raymond G.; and Miller, Albert L., to HITCO. Fibrous carbonaceous material sized with a glycidylhydantoin sizing. 4,145,472, Cl. 428-367.000.
SPEM-Societa Prodotti Elettroni Meccanici a.r.l.: *See—*
Tuninetti, Domenico, 4,145,727, Cl. 360-137.000.
Sperry Rand Corporation: *See—*
Nelson, Arthur R., 4,145,109, Cl. 350-96.140.
Spiral-Craft: *See—*
Dean, Robert O., 4,144,683, Cl. 52-182.000.
Spooner, Archer M.; and Lobb, Daniel R., to Redifon Flight Simulation Limited. Laser-eliminaion of mode beating. 4,145,712, Cl. 358-60.000.
Spriggs, Stephen R.: *See—*
Leffler, William T.; Hamler, Bruce W.; and Spriggs, Stephen R., 4,144,681, Cl. 52-127.000.
Sreeves, John E., to British Industrial Plastics, Ltd. Powdered coating composition of carboxyl terminated polyester, epoxy resin and zinc oxide. 4,145,370, Cl. 260-835.000.
Stadler, Paul, to Sandoz Ltd. Process for preparing oxazolo[3,2-a]pyrrolo[2,1-c]pyrazine derivatives. 4,145,549, Cl. 544-346.000.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Open end spinning assembly with an opener roll. 4,144,707, Cl. 57-58.910.
Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,144,707, Cl. 57-58.910.
Stait, Donald P., to Contraves AG. Apparatus for the detachable connection of a piston with a piston plunger. 4,144,885, Cl. 128-218.00P.
Standard Oil Company (Indiana): *See—*
Keske, Robert G., 4,145,522, Cl. 528-331.000.
Lerman, Michael A.; and Lark, John C., 4,145,461, Cl. 427-155.000.
Petrille, Dennis G.; and Culbertson, George S., 4,145,493, Cl. 526-58.000.
Skinner, David R., 4,145,161, Cl. 417-22.000.
Stanley Electric Co., Ltd.: *See—*
Teshima, Toru; Kashiwabara, Hoichiro; and Uchiyama, Yoshinori, 4,144,635, Cl. 29-572.000.
Stapp, Willis J.; and Honnert, Quentin E., to Multifold-International, Inc. Machine for packing flat articles in a case. 4,144,694, Cl. 53-52.000.
Stauffer Chemical Company: *See—*
Weil, Edward D., 4,145,547, Cl. 548-320.000.
Stecher, Friedhelm; Morsbach, Martin; and Johren, Paul, to Goetze AG. Axially and radially clamping spreader ring for an oil scraping piston ring. 4,145,060, Cl. 277-139.000.
Steelcase Inc.: *See—*
Vanden Hoek, Harold L., 4,144,924, Cl. 160-231.00A.
Steele, John M.; Nino, Guillermo J.; and Hanak, Fredric M., to Dow Chemical Company, The. Process for drying water-wet methyl chloride. 4,145,260, Cl. 203-14.000.
Steelman, Melvin W.: *See—*
Subera, Elmer J.; and Steelman, Melvin W., 4,144,720, Cl. 62-256.000.
Steffen, Dale A.: *See—*
Rinard, George A.; Rugg, Donald E.; and Steffen, Dale A., 4,145,122, Cl. 351-7.000.

Steffens, Bert. Process for the production of tampon blanks. 4,144,623, Cl. 28-118.000.

Stehlin, Bernhard; and Wilken, Joachim, to Dorina Nahmaschinen GmbH. Sewing machine for making decorative stitch patterns. 4,144,826, Cl. 112-158.00E.

Steinberg, Albert H.: *See*—
Segal, Leon; and Steinberg, Albert H., 4,145,227, Cl. 106-288.00B.

Steinborn, Gerhard: *See*—
Knoche, Karl F.; Cremer, Helmut; and Steinborn, Gerhard, 4,145,402, Cl. 423-579.000.

Stenkvist, Sven-Einar, to ASEA Aktiebolag. DC Arc furnace melt electrode. 4,145,562, Cl. 13-1.000.

Stephens Industries, Inc.: *See*—
Beard, James D.; and Beck, Gene F., 4,144,786, Cl. 83-732.000.

Sterzel, Hans-Josef; Schlichting, Karl; and Seydl, Wolfgang, to BASF Aktiengesellschaft. Thermoplastic polyester molding compositions with improved heat distortion point. 4,145,331, Cl. 260-40.00R.

Stevenson, James S., to Terminator Products, Inc. Probe system for containers. 4,144,901, Cl. 137-240.000.

Stewart, James A., to GTE Automatic Electric Laboratories, Inc. Power supply control circuit for subscriber carrier telephone system. 4,145,572, Cl. 179-2.0BC.

Stewart, Phil D. Golf swing training aid. 4,145,054, Cl. 273-186.00A.

Stiemert, Cyrus R. Snow scraper. 4,145,062, Cl. 280-11.37E.

Stierlen-Maquet Aktiengesellschaft: *See*—
Vetter, Klaus; and Heber, Rudolf, 4,145,078, Cl. 294-67.0DA.

Stiklorus, Lothar, to Messerschmitt-Bolkow-Blohm GmbH. Glide projectile having jettisonable keel fin. 4,145,017, Cl. 244-3.250.

Stockdale, Roy, to Napco Security Systems, Inc. Automatic telephone dialer for use in intrusion detection systems. 4,145,581, Cl. 179-90.0BB.

Stodolski, Thomas R., to Bell & Howell Company. Alerting system with dual-address memory. 4,145,684, Cl. 340-311.000.

Stolk, Steven A.: *See*—
Daenen, Theo E. G.; and Stolk, Steven A., 4,145,261, Cl. 204-14.00N.

Stone, Cynthia L.: *See*—
Daly, David M.; and Stone, Cynthia L., 4,145,082, Cl. 297-384.000.

Stone, Daniel H.: *See*—
Greenfield, Lawrence P.; Novak, George E.; and Stone, Daniel H., 4,145,079, Cl. 295-21.000.

Strachan & Henshaw Limited: *See*—
Julian, Anthony P., 4,144,812, Cl. 101-382.00R.
Julian, Anthony P., 4,144,813, Cl. 101-382.00R.

Strader, Don S., to Motor Wheel Corporation. Wheel rim assembly for tubeless pneumatic tires. 4,144,922, Cl. 152-410.000.

Strahsner, Emanuel; Kogler, Peter; and Zitz, Alfred J., to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Impeller for separating dust particles from an air stream. 4,145,197, Cl. 55-401.000.

Strandlund, Gert C.: *See*—
Berntsson, Peder B.; Brandstrom, Arne E.; Carlsson, Enar I.; Carlsson, Stig A. I.; Ek, Lars; Samuelsson, Benny R.; Sjostrand, Sven E.; Strandlund, Gert C.; and Ablad, Bengt A. H., 4,145,442, Cl. 424-330.000.

Stratmann, Josef: *See*—
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Straut, John E., to Abex Corporation. Pump for hydraulic brake actuator. 4,145,164, Cl. 417-252.000.

Strawson, Colin J.: *See*—
Aldridge, David C.; Crawley, Graham C.; and Strawson, Colin J., 4,145,437, Cl. 424-279.000.

Strobel, Manfred: *See*—
Knappstein, Johannes; Stratmann, Josef; and Strobel, Manfred, 4,145,195, Cl. 55-242.000.

Stroupe, James D., to Sipler Plastics, Inc. Method of making tubular article. 4,144,632, Cl. 29-469.500.

Stuart Ford Incorporated: *See*—
Ford, Stuart, 4,145,206, Cl. 71-23.000.

Stuhler, Harold A.: *See*—
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,145,309, Cl. 252-358.000.
Satterwhite, William A.; Leach, Robert M.; and Stuhler, Harold A., 4,145,310, Cl. 252-358.000.

Stumboli, Mark: *See*—
Sullivan, Richard A.; Sullivan, Debra; Stumboli, Mark; and Pervin, Kathryn L., 4,145,050, Cl. 273-96.00R.

Subera, Elmer J.; and Steelman, Melvin W., to Tyler Refrigeration Corporation. Air defrost system using secondary air band components. 4,144,720, Cl. 62-256.000.

Sublistatic Holding S.A.: *See*—
Hendriks, Dieter, 4,145,300, Cl. 252-62.10P.

Suchoff, Michael A., to Arp Instruments, Inc. Choral generator. 4,144,790, Cl. 84-1.240.

Sudarikov, Vasily L.: *See*—
Aroshidze, Jury V.; Iogansen, Vadim I.; Kadi-ogly, Ibragim A.; Petrov, Jury V.; Ptakul, Izrail A.; Romanov, Vasily V.; Sudarikov, Vasily L.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; and Shkoda, Gennady V., 4,145,626, Cl. 310-91.000.

Sudo, Ryoichi: *See*—
Hira, Yasuo; Sudo, Ryoichi; Takemoto, Issei; and Isogai, Tokio, 4,145,369, Cl. 260-831.000.

Suga, Tadoru. Packing apparatus. 4,144,697, Cl. 53-556.000.

Sugimoto, Masahiro: *See*—
Iida, Takao; Shirahata, Kunikatsu; Maisubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,145,253, Cl. 195-96.000.

Sugita, Yutaka: *See*—
Yoshizawa, Shigeru; Sugita, Yutaka; Saito, Nobuo; Arai, Yuji; and Yamaguchi, Nakahiko, 4,145,750, Cl. 365-6.000.

Sugiyama, Masahiko: *See*—
Noda, Fumiyoshi; and Sugiyama, Masahiko, 4,144,627, Cl. 29-157.00R.

Suhner, Werner, to Inventa AG fur Forschung und Patentverwertung, Zurich. Method of discharging and metering solids in liquids. 4,145,521, Cl. 528-323.000.

Sukornick, Bernard: *See*—
Sweeney, Richard F.; and Sukornick, Bernard, 4,145,368, Cl. 260-653.000.

Sullivan, Debra: *See*—
Sullivan, Richard A.; Sullivan, Debra; Stumboli, Mark; and Pervin, Kathryn L., 4,145,050, Cl. 273-96.00R.

Sullivan, Richard A.; Sullivan, Debra; Stumboli, Mark; and Pervin, Kathryn L. Device for catching and throwing an aerodynamic disc. 4,145,050, Cl. 273-96.00R.

Sulzer Brothers Ltd.: *See*—
Miszak, Pawel, 4,144,846, Cl. 122-479.00R.

Sumi, Masahiko, to Tokyo Shibaura Electric Co., Ltd. Electron beam exposure apparatus. 4,145,615, Cl. 250-492.00A.

Sumitomo Electric Industries, Ltd.: *See*—
Iwata, Koichi, 4,145,223, Cl. 106-36.000.

Sumitomo Heavy Industries, Ltd.: *See*—
Kato, Kazumasa; and Kadota, Kenji, 4,145,210, Cl. 75-3.000.

Sumitomo Metal Industries, Ltd.: *See*—
Honda, Eiichi, 4,144,736, Cl. 72-404.000.
Kato, Kazumasa; and Kadota, Kenji, 4,145,210, Cl. 75-3.000.

Sun Electric Corporation: *See*—
Trussell, Gerald C.; Arnston, Robert W.; and Elyashar, Daniel, 4,145,746, Cl. 364-551.000.

Sunaga, Ryuzoh; and Hasegawa, Kunimi, to Rank Xerox Limited. Electrophotographic reproducing machine blade cleaning apparatus. 4,145,137, Cl. 355-15.000.

Sunds AB: *See*—
Carlsson, Stig M., 4,145,039, Cl. 271-274.000.

Sunhouse, Incorporated: *See*—
Zebuhr, William H., 4,144,874, Cl. 126-271.000.
Zebuhr, William H., 4,144,999, Cl. 237-1.00A.

Sunpak Corporation: *See*—
Kogure, Yoshio; and Ozawa, Shuji, 4,145,134, Cl. 354-295.000.

Supertex, Inc.: *See*—
Blanchard, Richard A.; and Choy, Benedict C. K., 4,145,703, Cl. 357-55.000.

Suzuki, Hideaki: *See*—
Nosse, Yoshinori; Ono, Tomoyoshi; Suzuki, Hideaki; Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,145,271, Cl. 204-180.00P.

Suzuki, Hiroshi: *See*—
Takahashi, Hiroshi; Muto, Yasutami; Suzuki, Hiroshi; and Fukuda, Shiro, 4,144,675, Cl. 51-76.00R.

Suzuki, Motoaki: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; and Takamura, Toshihiro, 4,145,594, Cl. 219-61.000.

Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Information transferring apparatus. 4,145,755, Cl. 364-900.000.

Suzuki, Yasuo: *See*—
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,144,646, Cl. 32-40.00R.
Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, 4,144,882, Cl. 128-172.100.

Svitenko, Igor A.: *See*—
Rabinovich, Volf I.; Kriger, Jury N.; Sapozhnikov, Alexandr I.; Svitenko, Igor A.; Sapunov, Viktor E.; Filippov, Vyacheslav V.; and Karpov, Vladimir A., 4,145,563, Cl. 13-9.0ES.

Swan, Jack C., Jr., to Hanson Industries Inc. Viscous, flowable, pressure-compensating fitting materials and their use, including their use in boots. 4,144,658, Cl. 36-117.000.

Swann, David A. Electric switches. 4,145,586, Cl. 200-67.00G.

Sweany, Louis P., to P. R. Mallory & Co. Inc. Low cost buzzer. 4,145,688, Cl. 340-391.000.

Sweeney, Richard F.; and Sukornick, Bernard, to Allied Chemical Corporation. Process for the production of 1,1,1-trifluoro-2,2-dichloroethane. 4,145,368, Cl. 260-653.000.

Swindells, Richard; and Fredette, Maurice C. J., to ERCO Industries Limited. High efficiency chlorine dioxide production at low acidity with methanol addition. 4,145,401, Cl. 423-478.000.

Sylvester, Gerd; Witte, Josef; and Marwede, Gunter, to Bayer Aktiengesellschaft. Uranium-containing mixed catalysts and their use for the polymerisation of olefins. 4,145,497, Cl. 526-164.000.

Syntex (U.S.A.) Inc.: *See*—
Bliss, George D.; Kercso, Joseph E.; and McGuire, Richard J., 4,144,841, Cl. 119-5.000.
Untch, Karl G.; and Unger, Stefan H., 4,145,443, Cl. 424-324.000.

Systems, Science and Software: *See*—
Day, Edward A.; Seay, Glenn E.; and Ritter, Perry B., 4,144,814, Cl. 102-28.00R.

Systron-Donner Corporation: *See*—
Pickton, Shailer T., 4,145,649, Cl. 323-4.000.

Szego, Andrew; and Kallay, Victor, to Explosafe America Inc. Machine for expanding metal webs. 4,144,624, Cl. 29-6.100.

Szentesi, Otto I., to Northern Telecom Limited. Optical fibre connector for variable signal attenuation. 4,145,110, Cl. 350-96.150.

Szmuszkovicz, Jacob, to Upjohn Company, The. 2-Aminocycloaliphatic amide compounds. 4,145,435, Cl. 424-274.000.

Sztatisz, Janisz: *See—*
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.

Taber, Loren H.; Neilson, David R.; and Fuchslin, Stefan. Dump trailer. 4,145,085, Cl. 298-5.000.

Tachi, Seiichi: *See—*
Tanaka, Toshio; Nakagawa, Sumio; Miyanaka, Motosi; and Tachi, Seiichi, 4,145,179, Cl. 431-29.000.

Taflove, Allen: *See—*
Bridges, Jack; and Taflove, Allen, 4,144,935, Cl. 166-248.000.

Tahara, Kazutoki: *See—*
Sado, Ryoichi; and Tahara, Kazutoki, 4,145,317, Cl. 252-512.000.

Takada, Kenichi: *See—*
Takeuti, Fumihide; Takigawa, Toru; and Takada, Kenichi, 4,145,722, Cl. 358-223.000.

Takada, Masaharu, to Sasakura Engineering Company, Limited. Double-effect evaporator. 4,145,245, Cl. 159-13.00B.

Takagi, Yasuo: *See—*
Muranaka, Shigeo; Takagi, Yasuo; Araki, Yasushi; and Kakuta, Katsuyo, 4,144,860, Cl. 123-148.00C.

Takahashi, Hiroshi; Muto, Yasutami; Suzuki, Hiroshi; and Fukuda, Shiro, to Lion Hamigaki Kabushiki Kaisha; and K. T. Manufacturing Co., Ltd. Apparatus for treating top ends of flexible cords. 4,144,675, Cl. 51-76.00R.

Takahashi, Kozo: *See—*
Murakami, Masuo; Takahashi, Kozo; Murase, Kiyoshi; Mase, Toshiyasu; Ida, Hisashi; and Takenaka, Toichi, 4,145,363, Cl. 260-553.00A.

Takahashi, Masayuki: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, 4,145,333, Cl. 260-45.80N.

Takahashi, Naoki: *See—*
Miyakawa, Seii; and Takahashi, Naoki, 4,144,639, Cl. 29-809.000.

Takahashi, Toru, to Canon Kabushiki Kaisha. Scanning system for an electrostatic copying apparatus. 4,145,136, Cl. 355-8.000.

Takai, Isao; and Shindo, Noboru, to Murata Kikai Kabushiki Kaisha. False twisting apparatus. 4,144,700, Cl. 57-264.000.

Takai, Isao; and Shindo, Noboru, to Murata Kikai Kabushiki Kaisha. Apparatus for setting nip pressure of belts in false twister. 4,144,701, Cl. 57-336.000.

Takami, Katsumi; Ueda, Ken; Kawaguchi, Fumio; Tomura, Teruichi; and Ishimatsu, Kenji, to Hitachi Medical Corporation. Scintillator for a gamma ray camera. 4,145,609, Cl. 250-361.00R.

Takamura, Toshihiro: *See—*
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; and Takamura, Toshihiro, 4,145,594, Cl. 219-61.000.

Takaoka, Saburo; Yokogawa, Fumihiko; and Yamaguchi, Tadahiro, to Pioneer Electronic Corporation. Audio signal compressor and expansion system. 4,145,664, Cl. 330-85.000.

Takara Co., Ltd.: *See—*
Ogawa, Iwakichi, 4,144,669, Cl. 46-17.000.

Takasu, Mitsuo: *See—*
Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,145,404, Cl. 423-635.000.

Takechi, Hiroshi: *See—*
Gondo, Hisashi; Takechi, Hiroshi; Abe, Mitsunobu; and Namba, Kazuo, 4,145,235, Cl. 148-12.00C.

Takeda Chemical Industries, Ltd.: *See—*
Kuwada, Yutaka; and Meguro, Kanji, 4,145,418, Cl. 424-246.000.
Ochiai, Michihiko; Morimoto, Akira; Aki, Osami; and Okada, Taiiti, 4,145,540, Cl. 544-21.000.

Takeda, Tukasa, to Nitto Chemical Industry Co., Ltd. Induction heating apparatus with leakage flux reducing means. 4,145,591, Cl. 219-10.49R.

Takemoto, Issei: *See—*
Hira, Yasuo; Sudo, Ryoichi; Takemoto, Issei; and Isogai, Tokio, 4,145,369, Cl. 260-831.000.

Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, to Lion Hamigaki Kabushiki Kaisha; and Kano Denki Kabushiki Kaisha. Torsional ultrasonic vibrators. 4,144,646, Cl. 32-40.00R.

Takemoto, Kiyochika; Suzuki, Yasuo; Ochiai, Yoshihito; Nakashima, Syozi; and Hayashi, Midori, to Lion Hamigaki Kabushiki Kaisha. Device for exposing teeth to radiation of ultrasonic waves. 4,144,882, Cl. 128-172.100.

Takenaka, Toichi: *See—*
Murakami, Masuo; Takahashi, Kozo; Murase, Kiyoshi; Mase, Toshiyasu; Ida, Hisashi; and Takenaka, Toichi, 4,145,363, Cl. 260-553.00A.

Takeuchi, Ryozo; and Igawa, Tatsuo, to Hitachi, Ltd. Method for manufacturing gas insulated electrical apparatus. 4,145,101, Cl. 316-4.000.

Takeuti, Fumihide; Takigawa, Toru; and Takada, Kenichi, to Hitachi, Ltd. Image pickup tube devices. 4,145,722, Cl. 358-223.000.

Takigawa, Toru: *See—*
Takeuti, Fumihide; Takigawa, Toru; and Takada, Kenichi, 4,145,722, Cl. 358-223.000.

Takikawa, Toru, to Hitachi, Ltd. Pickup tube structure with an improved magnetic shield. 4,145,678, Cl. 335-214.000.

Tam, Richard K. W.: *See—*
Rau, John W., III; Muller, Harold H.; Tam, Richard K. W.; and Kabell, Louis J., 4,145,702, Cl. 357-45.000.

Tamada, Shigeharu: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tamada, Shigeharu; and Tanimura, Kaoru, 4,145,542, Cl. 544-128.000.

Tamaoka, Yutaka: *See—*
Hayasaka, Kuniyuki; and Tamaoka, Yutaka, 4,145,266, Cl. 204-131.000.

Tanabe, Kaname, to Tokyo Shibaura Electric Co., Ltd. X-ray source assembly. 4,145,616, Cl. 250-505.000.

Tanaka, Akira: *See—*
Kato, Takeshi; Tanaka, Akira; Hayashi, Jun; and Mikawa, Akikazu, 4,145,219, Cl. 96-74.000.

Tanaka, Ichiro: *See—*
Abe, Nobuyuki; Watanabe, Osamu; Tominaga, Masami; Nunokawa, Koji; Tanaka, Ichiro; and Manabe, Masao, 4,144,942, Cl. 175-286.000.

Tanaka, Jinkichi: *See—*
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; and Takamura, Toshihiro, 4,145,594, Cl. 219-61.000.

Tanaka, Toshio; Nakagawa, Sumio; Miyanaka, Motosi; and Tachi, Seiichi, to Hitachi, Ltd. Combustion control system. 4,145,179, Cl. 431-29.000.

Tanaka, Yoshiyuki: *See—*
Nagaoka, Tokuzo; Nishimura, Takamoto; Ono, Satoru; Nagata, Simaiti; Yamashita, Naoki; Tanaka, Yoshiyuki; and Hatabu, Yoshihiko, 4,145,399, Cl. 423-235.000.

Tani, Hoshiro: *See—*
Ushio, Tetsuji; Tatsuguchi, Satoru; and Tani, Hoshiro, 4,144,993, Cl. 228-107.000.

Tanida, Hiroshi: *See—*
Kasahara, Masao; Kouguchi, Noriyuki; Inaba, Mitugu; Kagawa, Masao; Yamada, Kunio; and Tanida, Hiroshi, 4,144,961, Cl. 198-472.000.

Taniguchi, Yoshiko: *See—*
Ohashi, Takashi; Okuyama, Toru; Arai, Katsuhiko; Taniguchi, Yoshiko; Saito, Masumi; and Sakata, Ryozo, 4,145,318, Cl. 521-112.000.

Taniguchi, Youkichi: *See—*
Kuwabara, Masamichi; Sasaki, Mitsuo; Uema, Sigeru; Taniguchi, Youkichi; Fukuchi, Noboru; and Kimura, Tohru, 4,145,462, Cl. 427-160.000.

Tanimura, Kaoru: *See—*
Nakagawa, Kazuyuki; Yoshizaki, Shiro; Tamada, Shigeharu; and Tanimura, Kaoru, 4,145,542, Cl. 544-128.000.

Tatara, Seiji; Domori, Yoshiki; Kumoda, Masashi; and Endo, Yusuke, to Nippon Soda Company Limited. Calcium hypochlorite composition. 4,145,306, Cl. 252-187.00H.

Tatsuguchi, Satoru: *See—*
Ushio, Tetsuji; Tatsuguchi, Satoru; and Tani, Hoshiro, 4,144,993, Cl. 228-107.000.

Tausch, Gerald, to Miller - Holzwarth, Inc. Periscope blackout blind construction. 4,145,119, Cl. 350-301.000.

Taylor Diving & Salvage Co., Inc.: *See—*
Wallace, Kenneth W.; and Gaudiano, Anthony V., 4,144,801, Cl. 98-1.500.

Taylor, Horace E.: *See—*
Bione, Angelo A.; Sehnert, Robert J.; and Taylor, Horace E., 4,144,788, Cl. 84-1.010.

Taylor, John B.: *See—*
Rowlands, David A.; and Taylor, John B., 4,145,419, Cl. 424-248.400.

Taylor, Robert P.: *See—*
Schmidt, Otto K.; and Taylor, Robert P., 4,144,894, Cl. 131-17.0AC.

Team, Inc.: *See—*
Harrison, George W., 4,144,909, Cl. 138-94.000.

Teijin Limited: *See—*
Ichikawa, Yataro; and Yamaji, Teizo, 4,145,366, Cl. 260-601.00R.
Nosse, Yoshinori; Ono, Tomoyoshi; Suzuki, Hideaki; Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,145,271, Cl. 204-180.00P.

Teitel, Robert J., to Texas Gas Transmission Corporation. Multi-step chemical and radiation process for the production of gas. 4,145,269, Cl. 204-157.10H.

Tel-Tone Corporation: *See—*
Twiss, Frank, 4,145,576, Cl. 179-16.0EC.

Teledyne Industries, Inc.: *See—*
Mackay, Frederick G.; Keryluk, Horace T.; and Cannon, Thomas G., 4,145,603, Cl. 219-387.000.
Moyer, Thomas D.; Smith, Raymond; Urbani, Aldo J.; Greenburg, Harley D.; Hamburg, Glenn W.; Marsh, Francis X.; and Van Huysen, Robert S., 4,144,950, Cl. 184-6.110.

Teledyne Mid-America Corporation: *See—*
Palloch, Herbert, 4,144,755, Cl. 74-230.010.

Tendulkar, Gautam: *See—*
Poppinger, Herbert; and Tendulkar, Gautam, 4,145,650, Cl. 323-17.000.

Terando, Norman H.: *See—*
Jones, Reuben G.; and Terando, Norman H., 4,145,554, Cl. 548-377.000.

Terlo, Vladimir I.: *See—*
Goloskov, Emmanuil I.; Kott, Isaak M.; Maevsky, Genrikh A.; Pinchuk, Mikhail P.; Pljuschev, Anatoly P.; and Terlo, Vladimir I., 4,145,174, Cl. 425-78.000.

Termansen, Paul E., to Danfoss A/S. Hydraulic steering device. 4,144,712, Cl. 60-384.000.

Terminator Products, Inc.: *See—*
Stevenson, James S., 4,144,901, Cl. 137-240.000.

Tersteegen, Bernd J. W.; and Van Endert, Gunther. Double lumen catheter. 4,144,884, Cl. 128-214.400.

Teshima, Toru; Kashiwabara, Hoichiro; and Uchiyama, Yoshinori, to Stanley Electric Co., Ltd. Method of manufacturing an indicating element. 4,144,635, Cl. 29-572.000.

Texaco Inc.: *See—*
Mead, Theodore C.; Sequeira, Avilino, Jr.; and Odell, Norman R., 4,145,273, Cl. 208-3.000.
Pitts, Robert W., Jr.; and Arnold, Dan M., 4,144,754, Cl. 73-205.00D.

Texacone Company, The: *See—*
Wheeler, John H., 4,145,057, Cl. 277-27.000.

Texas Gas Transmission Corporation: *See—*
Teitel, Robert J., 4,145,269, Cl. 204-157.10H.

Texas Instruments Incorporated: *See—*
Caudel, Edward R.; and Wilson, William R., 4,145,655, Cl. 325-15.000.
Cochran, Michael J.; and Hamilton, Stephen P., 4,145,756, Cl. 364-900.000.
Merryman, Jerry D.; Cochran, Michael J.; and Caudel, Edward R., 4,145,656, Cl. 325-25.000.
Orcutt, John W., 4,145,588, Cl. 200-83.00P.
Wakabayashi, Makoto; and Doherty, John, Jr., 4,144,998, Cl. 236-48.00R.

Thayer, William L.: *See—*
Kutowy, Oleh; Thayer, William L.; and Sourirajan, Srinvasa, 4,145,295, Cl. 210-500.00M.

Thiele, Manfred: *See—*
Beise, Hans; Schlicht, Burkhard; Thiele, Manfred; Gross, Manfred; Minak, Hans-Peter; Schingnitz, Manfred; Wehner, Klaus; and Burk, Werner, 4,145,192, Cl. 55-32.000.

Thiery, Jean: *See—*
Chatard, Michel; Pignard, Guy; and Thiery, Jean, 4,145,014, Cl. 242-83.000.

Thiokol Corporation: *See—*
Malik, Kuldip R., 4,145,467, Cl. 428-91.000.

Thoma, Peter; Habermann, Wolfgang; and Kranz, Joachim, to BASF Aktiengesellschaft. Preparation of metal-free phthalocyanines. 4,145,264, Cl. 204-59.00R.

Thomas & Betts Corporation: *See—*
Izraeli, Hyman, 4,144,737, Cl. 72-409.000.

Thomas J. Lipton, Inc.: *See—*
Dea, Iain C. M.; and Finney, David J., 4,145,454, Cl. 426-565.000.

Thomas, Jerald F.: *See—*
Gregory, Charles E.; Brian, Michael; Thomas, Jerald F.; and Cameron, James F., 4,144,903, Cl. 137-624.110.

Thomas Taylor and Sons, Inc.: *See—*
Veith, Robert S., 4,144,911, Cl. 139-383.00A.

Thomasson, Charles V.: *See—*
Kirkbride, Bernard J.; Downey, Robert A.; Thomasson, Charles V.; and Lewis, Joseph E., 4,144,684, Cl. 52-204.000.

Thomson-CSF: *See—*
Benoit-Gonin, Roger; Berger, Jean L.; and Fontanes, Sylvain, 4,145,676, Cl. 333-165.000.
Picquendar, Jean-Edgar, 4,145,675, Cl. 333-165.000.

Thoratec Laboratories Corporation: *See—*
Hill, J. Donald, 4,144,744, Cl. 73-49.100.

Thorn Electrical Industries Limited: *See—*
Coxon, George E., 4,145,332, Cl. 260-42.520.

Thrasher, Samuel R.: *See—*
French, James M.; and Thrasher, Samuel R., 4,144,929, Cl. 165-8.000.

Thyssen Industrie Aktiengesellschaft: *See—*
Schafer, Heinrich, 4,144,775, Cl. 74-665.0GA.

TI Accles & Pollock Limited: *See—*
Withers, Leslie G., 4,145,081, Cl. 297-216.000.

Tijburg, Rudolf P.; and van Dongen, Teunis, to U.S. Philips Corporation. Method of manufacturing a semiconductor device and semiconductor device manufactured according to the method. 4,145,262, Cl. 204-15.000.

Timex Corporation: *See—*
Mayer, Arthur, 4,144,769, Cl. 74-5.500.
Willis, Alan E., 4,144,706, Cl. 58-57.500.

Timmerman, Daniel M.; De Winter, Walter F.; and Van Hoof, Albert E., to Agfa-Gevaert, N.V. Silver halide element with polymeric mordanting agents for anionic compounds. 4,145,220, Cl. 96-84.00A.

Timmons, Suzanne D. Fashionable nursing garment. 4,144,593, Cl. 2-104.000.

Tkachenko, Andrei S., deceased: *See—*
Vinogradov, Alexandr P.; Pechersky, Mikhail A.; and Tkachenko, Andrei S., deceased, 4,144,748, Cl. 73-146.000.

Tkachenko, Nadezhda A., administrator: *See—*
Vinogradov, Alexandr P.; Pechersky, Mikhail A.; and Tkachenko, Andrei S., deceased, 4,144,748, Cl. 73-146.000.

Tohyama, Shunroku; Masuda, Yutaka; and Nogi, Tatsuo, to Toray Industries, Inc. Flame-retardant fiber having an excellent color-fastness and preparative method thereof. 4,145,371, Cl. 260-856.000.

Toida, Shigeo; Ohno, Akira; Higuchi, Kozo, deceased (by Higuchi, Michiko, heir at law and legal representative); by Higuchi, Makoto, heir at law; and Higuchi, Yuko, heir at law, to Marubeni Corporation; and Fuji Fine Chemical Co. Ltd. Process for recovering molybdenum, vanadium, cobalt and nickel from roasted products of used catalysts from hydrotreatment desulfurization of petroleum. 4,145,397, Cl. 423-54.000.

Tokoro, Masayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifying device of an internal combustion engine. 4,144,711, Cl. 60-276.000.

Tokunaga, Hideo: *See—*
Sako, Junichi; Honda, Norimasa; Tokunaga, Hideo; Hoshino, Toshiro; and Kai, Shin-ichiro, 4,145,385, Cl. 264-22.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Iwasaki, Kenji, 4,145,628, Cl. 313-60.000.
Sadamasa, Tetsuo; Naito, Makoto; and Nakamura, Tadao, 4,145,707, Cl. 357-68.000.
Sumi, Masahiko, 4,145,615, Cl. 250-492.00A.
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,145,755, Cl. 364-900.000.
Tanabe, Kaname, 4,145,616, Cl. 250-505.000.
Yahata, Haruki; Honda, Shunsuke; and Kawasaki, Tadamichi, 4,145,663, Cl. 329-50.000.

Tominaga, Masami: *See—*
Abe, Nobuyuki; Watanabe, Osamu; Tominaga, Masami; Nunokawa, Koji; Tanaka, Ichiro; and Manabe, Masao, 4,144,942, Cl. 175-286.000.

Tomura, Teruichi: *See—*
Takami, Katsumi; Ueda, Ken; Kawaguchi, Fumio; Tomura, Teruichi; and Ishimatsu, Kenji, 4,145,609, Cl. 250-361.00R.

Toporcer, Louis H.: *See—*
Homan, Gary R.; and Toporcer, Louis H., 4,145,359, Cl. 260-448.20N.

Topp, Alwin; Schmiedel, Klaus; and Schaeffer, Georg, to Hoechst Aktiengesellschaft. Process for the purification of waste water. 4,145,283, Cl. 210-63.00R.

Toray Industries, Inc.: *See—*
Kasahara, Masao; Kouguchi, Noriyuki; Inaba, Mitugu; Kagawa, Masao; Yamada, Kunio; and Tanida, Hiroshi, 4,144,961, Cl. 198-472.000.
Tohyama, Shunroku; Masuda, Yutaka; and Nogi, Tatsuo, 4,145,371, Cl. 260-856.000.

Toray Silicone Company, Ltd.: *See—*
Yamamoto, Yokichi; and Ohwaku, Yoshinari, 4,145,506, Cl. 528-10.000.

Toro Company, The: *See—*
Brackin, John F.; and Jendersee, Melvin H., 4,144,772, Cl. 74-242.15R.

Towmotor Corporation: *See—*
Melocik, Grant C., 4,144,946, Cl. 180-132.000.

Townsend & Townsend: *See—*
Nelson, Arthur L., 4,145,176, Cl. 425-405.00R.

Toyo Aluminium Kabushiki Kaisha: *See—*
Kuwabara, Masamichi; Sasaki, Mitsuo; Uema, Sigeru; Taniguchi, Youkichi; Fukuchi, Noboru; and Kimura, Tohru, 4,145,462, Cl. 427-160.000.

Toyo Co., Ltd.: *See—*
Ogata, Takeru, 4,144,693, Cl. 53-433.000.

Toyo Kohan Co., Ltd.: *See—*
Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, 4,145,263, Cl. 204-35.00R.

Toyo Rubber Co., Ltd., The: *See—*
Yabuta, Keiichiro; Marumo, Nagayuki; Shimabara, Yoichi; Ishigaki, Masahiro; Ishihara, Ken; and Mayama, Yoshiki, 4,144,921, Cl. 152-353.00R.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Nagano, Mineo; Awazawa, Shigeru; and Niwa, Tatsuhiko, 4,145,499, Cl. 526-201.000.

Toyobo Co., Ltd.: *See—*
Etoh, Kuniomi; and Nanpei, Masaru, 4,145,222, Cl. 96-115.00P.

Toyoda-Koki Kabushiki-Kaisha: *See—*
Tsuboi, Akira; and Yamakage, Tetsuro, 4,144,975, Cl. 414-736.000.

Toyomasu, Takeshi; Furusawa, Michito; Mabuchi, Sadao; and Gushima, Mitsuo, to Bridgestone Cycle Co. Ltd. Method of manufacturing bicycle frame by die casting and bicycle frame manufactured thereby. 4,145,068, Cl. 280-281.00R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kawai, Noriaki; and Yamamoto, Heisuke, 4,144,852, Cl. 123-97.00B.
Masui, Takatoshi; and Mituyasu, Masaki, 4,144,855, Cl. 123-119.0EC.
Morishita, Teru; and Kazaoka, Manabu, 4,144,710, Cl. 60-39.360.
Noda, Fumiyoshi; and Sugiyama, Masahiko, 4,144,627, Cl. 29-157.00R.
Tokoro, Masayoshi, 4,144,711, Cl. 60-276.000.

Trailer Train Company: *See—*
Greenfield, Lawrence P.; Novak, George E.; and Stone, Daniel H., 4,145,079, Cl. 295-21.000.

Trappo, Lucien. Centrifugal regulator. 4,144,725, Cl. 64-25.000.

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Travis, Jack R., to Anchor Hocking Corporation. Box separator. 4,144,995, Cl. 229-15.000.

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McClean, William G.; and Budge, Daniel C., 4,145,740, Cl. 364-469.000.

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Chuang, Jui-Chang; and Trucker, Donald E., 4,145,221, Cl. 96-95.000.

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Piotrowski, Wieslaw S., 4,145,672, Cl. 333-1.100.

Tseng, James W., to Robertshaw Controls Company. Two wire capacitance transmitter. 4,145,619, Cl. 307-118.000.

Tsubakimoto Chain Co.: *See—*
Morita, Minoru, 4,144,817, Cl. 104-108.000.

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Yoshimura, Tatsuro; Tsuchimoto, Takamitsu; and Hamada, Katsuyuki, 4,145,749, Cl. 364-900.000.

Tsuda, Yasuo: *See—*
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Tucci, John J., to AMP Incorporated. Portable apparatus for connecting wires in connectors. 4,144,633, Cl. 29-566.300.

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Turk, Herbert; and Schiminski, Herbert, to Barmag Barmer Maschinenfabrik AG. Device for winding synthetic fibers. 4,145,010, Cl. 242-18.00A.

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Ranninger, Guenther; and Twaroch, Franz, 4,145,113, Cl. 350-166.000.

Twiss, Frank, to Tel-Tone Corporation. DTMF and rotary dial signal receiver. 4,145,576, Cl. 179-16.0EC.

Tyers, G. Frank O.; Hughes, Howard C., Jr.; and Gwirtz, Kenneth, to Research Corporation. Cardiac electrodes for temporary pacing. 4,144,889, Cl. 128-418.000.

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Holzmann, Hermann, 4,145,075, Cl. 285-81.000.

Ube Industries, Ltd.: *See—*
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UCB Societe Anonyme: *See—*
Rodriguez, Ludovic; and Leclercq, Jacques, 4,145,343, Cl. 260-239.100.

Ucciani, Claude M.: *See—*
Becuwe, Alain G.; and Ucciani, Claude M., 4,145,361, Cl. 260-463.000.

Uchida, Kenji: *See—*
Sakamoto, Masakatsu; Uchida, Kenji; and Honma, Isao, 4,145,087, Cl. 302-14.000.

Uchidoi, Masanori: *See—*
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Uchiyama, Yoshinori: *See—*
Teshima, Toru; Kashiwabara, Hoichiro; and Uchiyama, Yoshinori, 4,144,635, Cl. 29-572.000.

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Uema, Sigeru: *See—*
Kuwabara, Masamichi; Sasaki, Mitsuo; Uema, Sigeru; Taniguchi, Youkichi; Fukuchi, Noboru; and Kimura, Tohru, 4,145,462, Cl. 427-160.000.

Uematsu, Shinichi: *See—*
Mizoguchi, Takahisa; Henmi, Hiroshi; Shima, Tsukasa; Yamashita, Yasuhiko; Uematsu, Shinichi; and Kawamura, Kazuo, 4,145,468, Cl. 428-239.000.

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Opitz, Konrad; and Uhde, Christa, 4,145,182, Cl. 8-39.00R.

Uhrhan, Paul; Oertel, Harald; Lantzsch, Reinhard; Roos, Ernst; and Arlt, Dieter, to Bayer Aktiengesellschaft. Permanently stabilized polyurethanes. 4,145,512, Cl. 528-73.000.

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Untch, Karl G.; and Unger, Stefan H., 4,145,443, Cl. 424-324.000.

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Bruylants, Philippe M.; Fripiat, Jose J.; Rodrigue, Luc W.; Poncelet, Georges M.; and Munaut, Antonin A., 4,145,301, Cl. 252-62.560.

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Hedaya, Eddie; Kawakami, James H.; and Kwiatkowski, George T., 4,145,504, Cl. 528-5.000.
Rosenthal, Louis A., 4,145,386, Cl. 264-22.000.
Solomon, Jack, 4,145,232, Cl. 148-16.500.

Union Oil Company of California: *See—*
Fleck, Raymond N.; and Hennig, Harvey, 4,144,715, Cl. 60-641.000.

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Coates, David; Gray, George W.; and McDonnell, Damien G., 4,145,114, Cl. 350-349.000.

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Leffler, William T.; Hamler, Bruce W.; and Spriggs, Stephen R., 4,144,681, Cl. 52-127.000.

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Army: *See—*
Funke, Maurice F.; and Goto, John M., 4,144,906, Cl. 137-819.000.
Mikeman, Carl H., 4,145,142, Cl. 356-229.000.
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Smith, Richard W., 4,145,680, Cl. 340-5.0MP.
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Goodson, Forrest R.; Shipman, William H.; and McCartney, Joseph F., 4,145,484, Cl. 429-105.000.
White, Robert E., 4,145,713, Cl. 358-92.000.

U.S. Philips Corporation: *See—*
Asselman, George A. A.; and Castelijns, Adrianus P. J., 4,144,933, Cl. 165-124.000.
Daenen, Theo E. G.; and Stolk, Steven A., 4,145,261, Cl. 204-14.00N.
De Bijl, Adrianus M. J.; and Cramwinckel, Hans, 4,145,745, Cl. 364-200.000.
Haubrich, Lothar; and Durr, Heinrich, 4,145,145, Cl. 400-124.000.
Koenings, Jos; and Kuppers, Dieter, 4,145,458, Cl. 427-39.000.
Kowalski, Gunter, 4,145,614, Cl. 250-445.00T.
Perilhou, Jean R., 4,145,610, Cl. 250-367.000.
Sitsen, Heinz; and Goppold, Otto, 4,145,096, Cl. 312-7.0TV.
Tijburg, Rudolf P.; and van Dongen, Teunis, 4,145,262, Cl. 204-15.000.

United States Steel Corporation: *See—*
Cutter, Louis A.; and Nunn, Robert E., 4,145,375, Cl. 260-874.000.

Universal Research Laboratories, Inc.: *See—*
Olliges, William E., 4,145,043, Cl. 273-1.00E.

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Hellwarth, Robert W., 4,145,671, Cl. 332-7.510.

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Guillet, James E.; and Dan, Ervin, 4,145,516, Cl. 528-85.000.

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Ayer, Donald E., 4,145,535, Cl. 542-426.000.
Bundy, Gordon L., 4,145,365, Cl. 260-586.00R.
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Fitch, Kandy A.; and Rowe, Englebert L., 4,145,440, Cl. 424-287.000.
Kelly, Robert C.; and Wechter, William J., 4,145,414, Cl. 424-180.000.

Szmuszkovicz, Jacob, 4,145,435, Cl. 424-274.000.
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Urban, Frank K. Therapeutic chair for cerebral palsy child. 4,145,083, Cl. 297-384.000.
Urbani, Aldo J.: *See—*
Moyer, Thomas D.; Smith, Raymond; Urbani, Aldo J.; Greenburg, Harley D.; Hamburg, Glenn W.; Marsh, Francis X.; and Van Huysen, Robert S., 4,144,950, Cl. 184-6.110.
Usdin, Vera R.; and Kaszynski, Edwin, to Gillette Company, The. Artificial skin darkening composition and method of using the same. 4,145,413, Cl. 424-63.000.
Ushio, Tetsuji; Tatsuguchi, Satoru; and Tani, Hoshiro, to Mishima Kosan Co., Ltd. Method of producing a continuous casting mold. 4,144,993, Cl. 228-107.000.
Utecht, Manfred, to Siemens Aktiengesellschaft. Support element for installation in the support assembly of a vertical electric machine. 4,145,019, Cl. 267-121.000.
Utzerath, James. Line segment video display apparatus. 4,145,754, Cl. 364-900.000.
v. Schwerdtner, Otto A. V., to Kraftwerk Union Aktiengesellschaft. Device for stabilizing flow through radial bores in rotating hollow cylinders, especially hollow shafts of gas turbines. 4,144,907, Cl. 138-39.000.
Vadetec Corporation: *See—*
Kemper, Yves J.; and Pouliot, Harvey N., 4,144,771, Cl. 74-60.000.
Valcalda, Florent, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Flexible support designed to support the conveyor belt of a conveyor. 4,144,964, Cl. 198-830.000.
Vale, Corwyn P.: *See—*
Murray, Christopher L.; and Vale, Corwyn P., 4,145,372, Cl. 260-857.0PE.
Valila, Veikko F., to Den-Tal-Ez Mfg. Co. X-ray source moving mechanism intended for panoramic radiography. 4,145,611, Cl. 250-439.00P.
Valyi, Emery I. Method for the preparation of hollow plastic articles. 4,145,392, Cl. 264-513.000.
Van Der Molen Machinefabriek B. V.: *See—*
Daenen, Bernardus, 4,144,896, Cl. 131-149.000.
Van Allan, James A.; Webster, Frank G.; and Reynolds, George A., to Eastman Kodak Company. Migration imaging process and compositions. 4,145,215, Cl. 96-1.0PE.
Vanden Hoek, Harold L., to Steelcase Inc. Panel connector system. 4,144,924, Cl. 160-231.00A.
van der Burg, Willem J., to Akzona Incorporated. Tetracyclic derivatives and pharmaceutical compositions of matter. 4,145,434, Cl. 424-274.000.
VanderKruik, Ronald K.: *See—*
Armstrong, David G.; Bickford, William J.; VanderKruik, Ronald K.; and Zimmer, John T., 4,145,692, Cl. 343-17.700.
van der Lely, Cornelis. Soil cultivating implements. 4,144,938, Cl. 172-59.000.
van Dongen, Teunis: *See—*
Tijburg, Rudolf P.; and van Dongen, Teunis, 4,145,262, Cl. 204-15.000.
Van Eenam, Donald N., to Monsanto Company. Air drying process. 4,145,248, Cl. 162-168.00R.
Vaneghem, Jean-Marie: *See—*
Brepoels, Joseph R.; and Vaneghem, Jean-Marie, 4,145,362, Cl. 260-465.00G.
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Tersteegen, Bernd J. W.; and Van Endert, Gunther, 4,144,884, Cl. 128-214.400.
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Mishcon, Lester, deceased; and Agulnek, Harry, 4,144,726, Cl. 66-140.00R.
Van Hoeven, William, Jr.: *See—*
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Van Hoof, Albert E.: *See—*
Timmerman, Daniel M.; De Winter, Walter F.; and Van Hoof, Albert E., 4,145,220, Cl. 96-84.00A.
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Moyer, Thomas D.; Smith, Raymond; Urbani, Aldo J.; Greenburg, Harley D.; Hamburg, Glenn W.; Marsh, Francis X.; and Van Huysen, Robert S., 4,144,950, Cl. 184-6.110.
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VanLingen, Eduard W.: *See—*
Alldredge, Robert L.; and VanLingen, Eduard W., 4,144,965, Cl. 198-831.000.
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Franks, Neal E.; and Varga, Julianna K., 4,145,532, Cl. 536-56.000.
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Veach, Carlos W. Music box with selectively programmable drum. 4,144,791, Cl. 84-96.000.
Veith, Robert S., to Thomas Taylor and Sons, Inc. Connector components. 4,144,911, Cl. 139-383.00A.
Venis, Ronald J., to Colour Video Services. Method and apparatus for digitally recording television images on film. 4,145,710, Cl. 358-7.000.
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Rabinovich, Volf I.; Kriger, Jury N.; Sapozhnikov, Alexandr I.; Svitenko, Igor A.; Sapunov, Viktor E.; Filippov, Vyacheslav V.; and Karpov, Vladimir A., 4,145,563, Cl. 13-9.0ES.
Vereinigte Aluminium-Werke A.G.: *See—*
Kampf, Fritz; and Kaltenberg, Hans-Georg, 4,144,934, Cl. 165-134.00R.
Plass, Ludolf, 4,145,398, Cl. 423-121.000.
Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft: *See—*
Meissner, Herbert, 4,145,234, Cl. 148-6.270.
Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Strahsner, Emanuel; Kogler, Peter; and Zitz, Alfred J., 4,145,197, Cl. 55-401.000.
Vetter, Klaus; and Heber, Rudolf, to Stierlen-Maquet Aktiengesellschaft. Loading and unloading station for conveyors with overhead trolley drives. 4,145,078, Cl. 294-67.0DA.
Vezirian, Edward, to Smith International, Inc. Rotary rock bit and method of making same. 4,145,094, Cl. 308-8.200.
Vialaret, Guy: *See—*
Gaechter, Jean-Pierre; Bourdeau, Charles; and Vialaret, Guy, 4,145,021, Cl. 248-371.000.
Victor Company of Japan, Ltd.: *See—*
Kosaka, Yoshiteru; and Hiraguri, Seisuke, 4,145,642, Cl. 318-331.000.
Vigneau, Paul: *See—*
Mosky, Nicolas; Gay, Jean; and Vigneau, Paul, 4,144,647, Cl. 33-12.000.
Vij, Hem R.: *See—*
Miller, Frank J.; and Vij, Hem R., 4,145,080, Cl. 296-183.000.
Vinals, Joaquin F.: *See—*
Mookherjee, Braja D.; Withycombe, Donald A.; Katz, Ira; Goossens, Alfred E.; Vock, Manfred H.; Evers, William J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,145,354, Cl. 260-347.200.
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Vipont Chemical Company: *See—*
Ladanyi, Peter A., 4,145,412, Cl. 424-58.000.
Viviani, Bruno: *See—*
Ferrero, Francesco; Sironi, Giuseppe; and Viviani, Bruno, 4,145,229, Cl. 106-304.000.
Vivitar Corporation: *See—*
Betensky, Ellis I., 4,145,115, Cl. 350-184.000.
Vock, Manfred H.: *See—*
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Vogelman, Joseph H. Non-invasive method for the measurement of body fat. 4,144,763, Cl. 73-433.000.
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Voigt, James R., to Kohler Co. Heat sink for rotating electronic circuitry. 4,144,932, Cl. 165-80.000.
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Voith Transmit GmbH: *See—*
Armasow, Waldemar; and Lindenthal, Hans, 4,144,724, Cl. 64-17.00A.
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Hofmann, Ruediger; and von Basse, Paul-Werner, 4,145,622, Cl. 307-270.000.
von Benda, Klaus, to Deutsche Automobilgesellschaft mbH, Firma. Galvanic cell having rechargeable zinc electrode. 4,145,482, Cl. 429-27.000.
von Bose, Robert J.: *See—*
Britton, Fred G.; Richardson, Murl R.; and von Bose, Robert J., 4,145,158, Cl. 405-208.000.
von Halasz, Sigmar P.; and Korinth, Jurgen, to Hoechst Aktiengesellschaft. Process for reactivating fluorination catalysts. 4,145,311, Cl. 252-415.000.
von Langendorff, Vitmar G., to Houdaille Industries, Inc. Parting tool. 4,144,785, Cl. 83-685.000.
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Vrable, Daniel L.: *See—*
Morse, David C.; and Vrable, Daniel L., 4,144,723, Cl. 62-332.000.
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Farello, Luciano; Prada, Cesare; and Restori, Ettore, 4,144,954, Cl. 188-165.000.
Poggio, Mario; and Muratore, Federico, 4,145,018, Cl. 246-34.00R.
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Reinecke, Erich; and Ulrich, Helmut, 4,145,089, Cl. 303-22.00R.
Wachs, Edward H.; and Kwech, Horst, to E. H. Wachs Company, The. Concrete pile-cutting machine. 4,144,867, Cl. 125-14.000.
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Wagaman, Neil D.; Meeks, Hatcher R.; and Alexander, Donald E., to Carrier Corporation. Humidifier. 4,145,384, Cl. 261-35.000.

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Bueler, Richard C.; and McWilliams, Dennis M., 4,145,091, Cl. 303-118.000.

Wagner, Richard J.: *See*—
Winder, William C.; and Wagner, Richard J., 4,145,450, Cl. 426-231.000.

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Walden, Jack M.: *See*—
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Olander, Emil E., Jr.; James, Rex J.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,752, Cl. 364-709.000.

Walker, Harold L.; and David, Don B. Grease and water separating apparatus. 4,145,287, Cl. 210-104.000.

Wall, Denton B.: *See*—
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Wallace, Kenneth W.; and Gaudiano, Anthony V., to Taylor Diving & Salvage Co., Inc. Method and apparatus for transporting and housing tunnel workers active in high pressure environments. 4,144,801, Cl. 98-1.500.

Waller, Donald F. Slitting machine clamping assembly. 4,145,013, Cl. 242-74.100.

Wallis, Christopher N., to International Business Machines Corporation. Electromagnetic actuator. 4,145,725, Cl. 360-106.000.

Wallis, Craig: *See*—
Melnick, Joseph L.; and Wallis, Craig, 4,145,304, Cl. 252-182.000.

Wallshein, Melvin. Retainer members for orthodontic brackets. 4,144,642, Cl. 32-14.00A.

Walter, Henry J.; and Kunz, Raymond W., to Clairol Incorporated. Device for treating hair with heat and vapor. 4,145,600, Cl. 219-222.000.

Wang, An: *See*—
Dunning, Donald R.; Koplow, Harold S.; Moros, David; Wang, An; and Wild, A. Edward, Jr., 4,145,739, Cl. 364-200.000.

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Watanabe, Itaru: *See*—
Koshiga, Fusao; Tanaka, Jinkichi; Watanabe, Itaru; Suzuki, Motoaki; and Takamura, Toshihiro, 4,145,594, Cl. 219-61.000.

Watanabe, Masanori: *See*—
Onda, Eiichi; Koyama, Mitsuo; Nakagawa, Tadashi; Watanabe, Masanori; and Nemoto, Ichiro, 4,145,132, Cl. 354-249.000.

Watanabe, Michiko: *See*—
Fujimaki, Masao; Arai, Soichi; Watanabe, Michiko; Hashimoto, Yukio; and Kurooka, Akira, 4,145,455, Cl. 426-614.000.

Watanabe, Mineo: *See*—
Nosse, Yoshinori; Ono, Tomoyoshi; Suzuki, Hideaki; Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,145,271, Cl. 204-180.00P.

Watanabe, Osamu: *See*—
Abe, Nobuyuki; Watanabe, Osamu; Tominaga, Masami; Nunokawa, Koji; Tanaka, Ichiro; and Manabe, Masao, 4,144,942, Cl. 175-286.000.

Watanabe, Seiji: *See*—
Imai, Masaya; and Watanabe, Seiji, 4,145,059, Cl. 277-81.00R.

Watkins, Lesley G.: *See*—
Johnson, Earl R.; and Watkins, Lesley G., 4,144,953, Cl. 188-134.000.

Watson, Robert E.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,742, Cl. 364-709.000.
Olander, Emil E., Jr.; James, Rex J.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,752, Cl. 364-709.000.

Waugh, Bobby L. Temporary highway reflector cover. 4,145,152, Cl. 404-71.000.

Waxman, Elliot: *See*—
Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard, 4,145,720, Cl. 358-194.000.

Webb, Harry M., to Natural Resources Guardianship International, Inc. Catalytic fuel additive for jet, gasoline, diesel, and bunker fuels. 4,145,190, Cl. 44-56.000.

Webb, William E. Work piece mounting stand. 4,145,006, Cl. 269-69.000.

Weber, Karl-Heinz: *See*—
Langbein, Adolf; Weber, Karl-Heinz; and Boke, Karin, 4,145,427, Cl. 424-267.000.

Webster, David L., to Kustom Fit Manufacturing Company. Retractable apparatus for supporting an element. 4,145,020, Cl. 248-161.000.

Webster, Frank G.: *See*—
Van Allan, James A.; Webster, Frank G.; and Reynolds, George A., 4,145,215, Cl. 96-1.0PE.

Wechter, William J.: *See*—
Kelly, Robert C.; and Wechter, William J., 4,145,414, Cl. 424-180.000.

Wehner, Klaus: *See*—
Beise, Hans; Schlicht, Burkhard; Thiele, Manfred; Gross, Manfred; Minak, Hans-Peter; Schingnitz, Manfred; Wehner, Klaus; and Burk, Werner, 4,145,192, Cl. 55-32.000.

Wehrmeister, Allen E., to Babcock & Wilcox Company, The. Apparatus for the in-situ detection and location of flaws in welds. 4,144,766, Cl. 73-587.000.

Weigt, Donald A.: *See*—
Guif, Stanley E.; Nimmer, Terry L.; Weigt, Donald A.; Wolenec, Glenn; and Gall, Richard C., 4,145,717, Cl. 358-121.000.

Weil, Edward D., to Stauffer Chemical Company. Ureidoalkylphosphonates and their use for the flameproofing of textiles. 4,145,547, Cl. 548-320.000.

Weimer, Dean R.; and Freshour, Kenneth D., to Continental Oil Company. Prevention of PVC polymer buildup in polymerization reactors using oxalyl bis(benzylidenehydrazide) and alumina. 4,145,496, Cl. 526-62.000.

Weinberg, Robert: *See*—
Gosanko, Clarence; and Weinberg, Robert, 4,144,661, Cl. 40-10.00D.

Weingartner, Bernhard, to Neutrik Aktiengesellschaft. Housing for electrical devices. 4,145,566, Cl. 174-65.00R.

Weinrich, Bernard W.: *See*—
Fisher, Stanton E.; and Weinrich, Bernard W., 4,145,447, Cl. 426-72.000.

Weinstock, Leonard M.: *See*—
Mulvey, Dennis M.; and Weinstock, Leonard M., 4,145,364, Cl. 260-578.000.

Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard. Remote control. 4,145,720, Cl. 358-194.000.

Weir, William A.: *See*—
Emerton, Barry G.; Weir, William A.; and McLean, Thomas F., 4,144,927, Cl. 164-108.000.

Weisgerber, William C. Screw for eye glass frames. 4,145,124, Cl. 351-121.000.

Weishaar, Michael F.; and Ballard, F. Leon, to Monsanto Company. Water purification process. 4,145,281, Cl. 210-37.00B.

Welding Nozzle Incorporated: *See*—
Keller, Klaus; and Keller, Erich, 4,145,595, Cl. 219-75.000.

Wells, Thomas R.: *See*—
Bagby, John P.; Hapke, Kenyon A.; and Wells, Thomas R., 4,145,126, Cl. 352-74.000.

Welz, Hermann: *See*—
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Wenninger, Fred, Jr.: *See*—
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Werderitch, Frank J. Start-stop circuit for split phase motor. 4,145,646, Cl. 318-782.000.

Wernli, Max, to Georg Fischer Aktiengesellschaft. Method and apparatus for the production of foundry sand molds. 4,144,925, Cl. 164-7.000.

West, Martin M.: *See*—
Juneau, Paul W., Jr.; and West, Martin M., 4,145,328, Cl. 260-30.40R.

Western Electric Company, Inc.: *See*—
Finley, Donald W.; and Lewis, Robert B., 4,145,460, Cl. 427-97.000.

Westinghouse Air Brake Company: *See*—
Hart, James E., 4,145,090, Cl. 303-37.000.
Noble, Peter M., 4,145,141, Cl. 356-123.000.

Westinghouse Electric Corp.: *See*—
Babcock, Richard V.; Pack, John L.; and Hundstad, Richard L., 4,145,669, Cl. 331-94.5PE.
Bains, Gurdip S., 4,144,689, Cl. 52-285.000.
Cumming, Allen R.; and Peterson, Clyde O., 4,144,815, Cl. 102-214.000.
DeCaro, Aristide R.; and Rainone, Nicholas J., 4,145,630, Cl. 313-273.000.
Evans, George S.; and Skwirut, Henry, 4,145,634, Cl. 313-490.000.
Rainone, Nicholas J., 4,145,730, Cl. 362-10.000.

Westran Corporation: *See*—
Berlinger, Bernard E., Jr., 4,144,774, Cl. 74-435.000.

Wetzler, Matthias; and Dockner, Toni, to BASF Aktiengesellschaft. Manufacture of 4-nitroimidazoles. 4,145,553, Cl. 548-338.000.

Weyenberg, Robert J.; and Seidler, Don W., to American Can Com-

pany. Packaging for controlled release of volatile substances. 4,145,001, Cl. 239-56.000.
Wheeler, H. Brownell. Occlusive impedance phlebograph and method therefor. 4,144,878, Cl. 128-2.05V.
Wheeler, John H., to Texacone Company, The. Packing member. 4,145,057, Cl. 277-27.000.
Whirlpool Corporation: *See*—
MacFarlane, Thomas R.; and Sickert, Richard G., 4,144,596, Cl. 4-166.000.
White, Derek G. W.; Holloway, Nicholas H.; and Attwood, Brian W., to Karl Kroyer St. Anne's Limited. Dry-laying a web of particulate or fibrous material. 4,144,619, Cl. 19-304.000.
White, Robert E., to United States of America, Navy. Composite video signal field recognition circuit. 4,145,713, Cl. 358-92.000.
Whitehurst, Darrell D.: *See*—
Haag, Werner O.; and Whitehurst, Darrell D., 4,145,486, Cl. 521-31.000.
Whitmore, Henry B. Total body volume meter. 4,144,749, Cl. 73-149.000.
Whitten, Billy L. Pipe grooving apparatus. 4,144,733, Cl. 72-105.000.
Wiggins, Garfield. Doweling jig. 4,145,160, Cl. 408-103.000.
Wiig, Selmer L., to Lockheed Electronics Company, Inc. Tensioning apparatus. 4,145,016, Cl. 242-193.000.
Wilbur, Milton S., to Jablecki, Elizabeth S. Liquid phase separator with valved outlet means. 4,145,294, Cl. 210-419.000.
Wild, A. Edward, Jr.: *See*—
Dunning, Donald R.; Koplow, Harold S.; Moros, David; Wang, An; and Wild, A. Edward, Jr., 4,145,739, Cl. 364-200.000.
Wiles, Michael F.: *See*—
Carlow, Earl F.; Mathys, Wilbur L.; Mensch, William D.; Peddle, Charles; and Wiles, Michael F., 4,145,751, Cl. 364-900.000.
Gunter, Thomas G.; Musa, Fuad H.; Shaw, Pern; and Wiles, Michael F., 4,145,761, Cl. 365-227.000.
Wilken, Joachim: *See*—
Stehlin, Bernhard; and Wilken, Joachim, 4,144,826, Cl. 112-158.00E.
Williams, Alea. Refrigeration system. 4,144,718, Cl. 62-180.000.
Williams, Edward A.: *See*—
Akers, Larry D.; Scholl, Charles H.; Smith, Joseph S.; and Williams, Edward A., 4,144,913, Cl. 141-2.000.
Williams, Ronald L.; and McKeen, Robert G., to Skyline Parts, Inc. Air conditioning apparatus. 4,144,719, Cl. 62-239.000.
Williamson, Herschel M.: *See*—
McLuckie, Walter L.; and Williamson, Herschel M., 4,145,073, Cl. 280-702.000.
Williamson, Jim R.: *See*—
Jackson, Gerald D.; Williamson, Jim R.; and Zimmerman, John C., 4,144,937, Cl. 166-314.000.
Willis, Alan E., to Timex Corporation. Alarm watch with remote sonic generator. 4,144,706, Cl. 58-57.500.
Willis, Donald H., to RCA Corporation. Television receiver protection circuit. 4,145,639, Cl. 315-411.000.
Wilson, Lowell T.; and Plassmann, Herbert A., to Ohio Art Company, The. Portable basketball set. 4,145,044, Cl. 273-1.50R.
Wilson, Phillip S.: *See*—
Mark, Victor; and Wilson, Phillip S., 4,145,329, Cl. 260-30.40R.
Wilson, William R.: *See*—
Caudel, Edward R.; and Wilson, William R., 4,145,655, Cl. 325-15.000.
Winder, William C.; and Wagner, Richard J., to Hartel Corporation. Method and apparatus for controlling composition of milk. 4,145,450, Cl. 426-231.000.
Winn, Martin; and Kyncl, John J., to Abbott Laboratories. Aminomethylene oxindoles. 4,145,422, Cl. 424-250.000.
Winter, Bruce L.: *See*—
Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; and Winter, Bruce L., 4,145,274, Cl. 208-8.000.
Winther, Earl C. Tire chain construction. 4,144,920, Cl. 152-233.000.
Wintzer, Klaus, to Siemens Aktiengesellschaft. Circuit arrangement for the transmission of digital signals between subscriber stations of a time multiplex telecommunications network. 4,145,574, Cl. 179-15.00A.
Winz, Hans: *See*—
Gotz, Hans; Hack, Albert; and Winz, Hans, 4,144,803, Cl. 98-2.180.
Wirth, Gallo & Co.: *See*—
Gallo, Mario, 4,144,943, Cl. 177-210.0FP.
Wiser, John A. Valet rack. 4,144,972, Cl. 211-113.000.
Wisotzky, Otto G.; and Blackburn, Tom L., to GTE Automatic Electric Laboratories, Inc. Regulating amplifier. 4,145,665, Cl. 330-254.000.
Withers, John A.; Hull, Charles H.; and Horsfall, Harry, to David Brown Tractors Limited. Power steering systems. 4,144,947, Cl. 180-132.000.
Withers, Leslie G., to TI Accles & Pollock Limited. Vehicle seat. 4,145,081, Cl. 297-216.000.
Witherspoon, Ronald A.: *See*—
Boynton, Rudy C.; and Witherspoon, Ronald A., 4,144,728, Cl. 70-58.000.
Withycombe, Donald A.: *See*—
Mookherjee, Braja D.; Withycombe, Donald A.; Katz, Ira; Goossens, Alfred E.; Vock, Manfred H.; Evers, William J.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,145,354, Cl. 260-347.200.
Witte, Josef: *See*—
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Witzel, Bruce E.: *See*—
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Wojtowicz, John A.; and Herms, William C., to Olin Corporation. Alkali metal dichloroisocyanurate compositions. 4,145,543, Cl. 544-190.000.
Wolenec, Glenn: *See*—
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Wolf, Charles B.: *See*—
Fey, Maurice G.; and Wolf, Charles B., 4,145,403, Cl. 423-613.000.
Wolf, Peter, to Lambert Brake Corporation. Combined power and manually activated brake system. 4,145,088, Cl. 303-2.000.
Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans J., to Bayer Aktiengesellschaft. Reaction mixtures, processes for their preparation and their use as polymerization initiators. 4,145,507, Cl. 528-25.000.
Wolford, Dale E., to Gorman-Rupp Company, The. Waste material pumping apparatus. 4,145,008, Cl. 241-46.170.
Wolfram, Adolf E., to General Electric Company. UHF electronic tuner. 4,145,659, Cl. 325-468.000.
Wolkstein, Herbert J.: *See*—
Freeling, Marvin R.; and Wolkstein, Herbert J., 4,145,691, Cl. 343-7.0AG.
Wolters, Tjako A.: *See*—
Middelbeek, Cornelis G.; Polano, Machiel E.; and Wolters, Tjako A., 4,145,280, Cl. 210-20.000.
Woltersdorf, Otto W., Jr.: *See*—
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Bock, Mark G., 4,145,551, Cl. 544-407.000.
Wong, George S. K., to Canadian Patents and Development Limited. Precision measuring amplifier. 4,145,661, Cl. 328-145.000.
Woo, Peter W. K.; and Haskell, Theodore H., to Parke, Davis & Company. Production of 3'-deoxybutirosina A. 4,145,529, Cl. 536-17.000.
Woodstream Corporation: *See*—
Souza, Anthony J., 4,144,667, Cl. 43-61.000.
Wozny, Mary E., to Borg-Warner Corporation. High nitrile polymer compositions containing glutaraldehyde. 4,145,489, Cl. 526-1.000.
Wubbe, Leo J., to Anderson Company, The. Hook-ended arm connector. 4,144,613, Cl. 15-250.320.
Wuchter, Richard B.: *See*—
Nemec, Joseph W.; and Wuchter, Richard B., 4,145,559, Cl. 560-190.000.
Wysong, Robert D., to Shakespeare Marine Electronics, Inc. Thermal printhead biasing arrangement. 4,145,698, Cl. 346-139.00R.
Xerox Corporation: *See*—
Kew, Jeffrey, 4,145,041, Cl. 271-233.000.
Yabuta, Keiichiro; Marumo, Nagayuki; Shimabara, Yoichi; Ishigaki, Masahiro; Ishihara, Ken; and Mayama, Yoshiki, to Nissan Motor Company, Limited; and Toyo Rubber Co., Ltd., The. Pneumatic tire with an internal damage indicator. 4,144,921, Cl. 152-353.00R.
Yagi, Shinichi: *See*—
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Yahata, Haruki; Honda, Shunsuke; and Kawasaki, Tadamichi, to Tokyo Shibaura Electric Co., Ltd. Digital synchronous detectors using time division for extracting carrier wave and demodulated signals. 4,145,663, Cl. 329-50.000.
Yamada, Akio; and Shimizu, Shohachi. Bit for electric drills. 4,145,159, Cl. 407-53.000.
Yamada, Hiroshi: *See*—
Habu, Teiji; Nakano, Masashi; Tsuda, Yasuo; Sakamoto, Eiichi; and Yamada, Hiroshi, 4,145,218, Cl. 96-66.300.
Yamada, Kunio: *See*—
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Yamada, Shigeki: *See*—
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, 4,145,736, Cl. 364-200.000.
Yamada, Takahiko; Yamada, Shigeki; Sakurai, Yoshio; Furukawa, Kazuo; Kajitsuka, Syoji; and Awaji, Toshio, to Nippon Telegraph and Telephone Public Corporation; Nippon Electric Co., Ltd.; Hitachi, Ltd.; Oki Electric Industry Co., Ltd.; and Fujitsu Limited. Microprogram control device. 4,145,736, Cl. 364-200.000.
Yamada, Takashi: *See*—
Shirasaki, Shinji; Yamada, Takashi; Fukaya, Hiroyasu; and Sakakibara, Yukio, 4,145,608, Cl. 250-231.0SE.
Yamaguchi, Miwako. Cleansing and wiping cloth. 4,144,612, Cl. 15-208.000.
Yamaguchi, Nakahiko: *See*—
Yoshizawa, Shigeru; Sugita, Yutaka; Saito, Nobuo; Arai, Yuji; and Yamaguchi, Nakahiko, 4,145,750, Cl. 365-6.000.
Yamaguchi, Tadahiro: *See*—
Takaoka, Saburo; Yokogawa, Fumihiko; and Yamaguchi, Tadahiro, 4,145,664, Cl. 330-85.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, 4,144,861, Cl. 123-179.00G.
Yamaji, Teizo: *See*—
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Yamakage, Tetsuro: *See*—
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Yamamichi, Masayoshi: *See*—
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Yamamori, Takahiro; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Change-speed planetary transmission. 4,144,776, Cl. 74-759.000.

Yamamoto, Heisuke: *See*—
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Yamamoto, Hiroshi: *See*—
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Yamamoto, Toshiyuki: *See*—
Hamazaki, Yasuhiko; Kawabata, Shozo; Yamamoto, Toshiyuki; Shiraishi, Yasuo; and Ueno, Akira, 4,145,444, Cl. 424-331.000.

Yamamoto, Yokichi; and Ohwaku, Yoshinari, to Toray Silicone Company, Ltd. Packing materials for gas separation columns. 4,145,506, Cl. 528-10.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Murakami, Masuo; Takahashi, Kozo; Murase, Kiyoshi; Mase, Toshiyasu; Ida, Hisashi; and Takenaka, Toichi, 4,145,363, Cl. 260-553.00A.

Yamashita, Naoki: *See*—
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Yamashita, Ryuichi; Matsumoto, Hiromitsu; and Eda, Masato, to Yamaha Hatsudoki Kabushiki Kaisha. Fuel supply for internal combustion engines. 4,144,861, Cl. 123-179.00G.

Yamashita, Yasuhiko: *See*—
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Yamazaki, Kazuya; and Yonekura, Mikio, to Amada Company, Limited. Apparatus for blanking sheet materials. 4,144,783, Cl. 83-216.000.

Yamazaki, Tetsuya; and Koizumi, Ken, to Nippon Sheet Glass Co., Ltd. Production of optical glass fibers. 4,145,200, Cl. 65-2.000.

Yan, Tsoung Y.: *See*—
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Yasuda, Hiroshi, to Fujitsu Limited. Electron beam lithographic system. 4,145,597, Cl. 219-121.0EB.

Yates, Robert W.: *See*—
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Yeda Research and Development Co. Ltd.: *See*—
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Yeh, Yu S.: *See*—
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Yerushalmi, Shmuel: *See*—
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Yevick, George J., to Izon Corporation. Compact camera and viewer apparatus. 4,145,131, Cl. 354-115.000.

Yockey, Francis J.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,742, Cl. 364-709.000.
Olander, Emil E., Jr.; James, Rex J.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,145,752, Cl. 364-709.000.

Yoerger, William E., to Eastman Kodak Company. Co-crystalline organic photoconductors and heterogeneous compositions thereof. 4,145,214, Cl. 96-1.0PC.

Yokogawa Electric Works, Ltd.: *See*—
Nakamoto, Koichiro; Ohyama, Nobumi; Adachi, Kiyoshi; and Kuwahara, Hajime, 4,144,741, Cl. 73-19.000.

Yokogawa, Fumihiko: *See*—
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Yokoyama, Akira, to Honeywell Inc. Square wave signal generator. 4,144,751, Cl. 73-194.0EM.

Yonekura, Mikio: *See*—
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Yoshida, Hirokazu: *See*—
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Yoshida Kogyo K.K.: *See*—
Ishiba, Jintaro, 4,144,734, Cl. 72-253.00A.

Yoshimura, Tatsuro; Tsuchimoto, Takamitsu; and Hamada, Katsuyuki, to Fujitsu Limited. Log in-out system for logic apparatus. 4,145,749, Cl. 364-900.000.

Yoshinaka, Tadaaki, to Sony Corporation. Time base correction of color video signal from playback apparatus. 4,145,705, Cl. 358-8.000.

Yoshinari, Hirota. Flexible-sheet fixing device. 4,144,622, Cl. 24-243.00K.

Yoshino Kogyosho Co., Ltd.: *See*—
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Yoshizaki, Shiro: *See*—
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Yoshizawa, Shigeru; Sugita, Yutaka; Saito, Nobuo; Arai, Yuji; and Yamaguchi, Nakahiko, to Hitachi, Ltd.; and Nippon Telegraph and Telephone Public Corporation. Field access magnetic bubble memory device. 4,145,750, Cl. 365-6.000.

Younger, Lloyd: *See*—
Shelton, George E., 4,144,698, Cl. 56-1.000.

Yu, Chia-Nien: *See*—
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Zaidanhojin Nipponrodobunkakyokai: *See*—
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Zdanowski, Richard E.: *See*—
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Zebuhr, William H., to Sunhouse, Incorporated. Solar panel. 4,144,874, Cl. 126-271.000.

Zebuhr, William H., to Sunhouse, Incorporated. System and structure for conditioning air. 4,144,999, Cl. 237-1.00A.

Zegers, Jacques T. L.: *See*—
Bracke, William J. I.; Bertrand, Jean N. M.; and Zegers, Jacques T. L., 4,145,376, Cl. 260-876.00B.

Zender, James P., to ESB Incorporated. Polarity indicator for battery charger. 4,145,648, Cl. 320-25.000.

Zielinski, Walter J.: *See*—
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,145,448, Cl. 426-72.000.

Zimmer, John T.: *See*—
Armstrong, David G.; Bickford, William J.; VanderKruik, Ronald K.; and Zimmer, John T., 4,145,692, Cl. 343-17.700.

Zimmerman, John C.: *See*—
Jackson, Gerald D.; Williamson, Jim R.; and Zimmerman, John C., 4,144,937, Cl. 166-314.000.

Zitz, Alfred J.: *See*—
Strahsner, Emanuel; Kogler, Peter; and Zitz, Alfred J., 4,145,197, Cl. 55-401.000.

Zolna, Laszlo: *See*—
Kurucz, Eva; Lukacs, Piroska; Kollar, Lajos; Barics, Jozsef; Gulyas, Jozsef; Zolna, Laszlo; Juhasz, Balazs; Fodor, Lajos; Gal, Sandor; Hollo, Janos; Pungor, Erno; Sztatisz, Janisz; and Zolnay, Jeno, 4,145,446, Cl. 426-69.000.

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Ioffe, Benyamin A.; Zommer, Jury A.; Kalnin, Robert K.; and Kanaev, Alexandr S., 4,144,637, Cl. 29-739.000.

Zorzi, Paul A.; Allen, Thomas S.; and Kucsma, Michael E., to Ethyl Corporation. Flame retardant polypivalolactone compositions. 4,145,330, Cl. 260-37.00R.

Zschimmer, Gero. Process for mounting components on a base by means of thixotropic material. 4,145,390, Cl. 264-69.000.

LIST OF REISSUE PATENTEES

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Albertson, Noel F.: *See*—
Wentland, Mark P.; and Albertson, Noel F., Re. 29,943, Cl. 546-97.000.

Applied Power Inc.: *See*—
Knutson, Dale A., Re. 29,938, Cl. 180-89.150.

Arp, George F. Swimming pool wall. Re. 29,936, Cl. 52-169.700.

Bird, Graham, to Petrocarbon Developments Ltd. Method and apparatus for separating gases. Re. 29,941, Cl. 55-21.000.

Board of Regents, State of Florida: *See*—
Williams, David T., Re. 29,939, Cl. 356-329.000.

Champion International Corporation: *See*—
Knoell, Lawrence H., Re. 29,940, Cl. 425-504.000.

DiDonato, Russell: *See*—
Mahaffy, Reid A.; Kimbaris, James C.; and DiDonato, Russell, Re. 29,937, Cl. 53-511.000.

Eastman Kodak Company: *See*—
Hannie, David E., Re. 29,942, Cl. 96-29.00D.

Hannie, David E., to Eastman Kodak Company. Processing compositions for color transfer processes comprising alkali metal fluorides. Re. 29,942, Cl. 96-29.00D.

Kimbaris, James C.: *See*—
Mahaffy, Reid A.; Kimbaris, James C.; and DiDonato, Russell, Re. 29,937, Cl. 53-511.000.

Knoell, Lawrence H., to Champion International Corporation. Apparatus for lining cartons. Re. 29,940, Cl. 425-504.000.

Knutson, Dale A., to Applied Power Inc. Tilt cab power stream and valve control therefor. Re. 29,938, Cl. 180-89.150.

Mahaffy & Harder Engineering Co.: *See*—
Mahaffy, Reid A.; Kimbaris, James C.; and DiDonato, Russell, Re. 29,937, Cl. 53-511.000.

Mahaffy, Reid A.; Kimbaris, James C.; and DiDonato, Russell, to Mahaffy & Harder Engineering Co. Continuous movement packaging machine. Re. 29,937, Cl. 53-511.000.

Petrocarbon Developments Ltd.: *See*—
Bird, Graham, Re. 29,941, Cl. 55-21.000.

Sterling Drug Inc.: *See*—
Wentland, Mark P.; and Albertson, Noel F., Re. 29,943, Cl. 546-97.000.

Wentland, Mark P.; and Albertson, Noel F., to Sterling Drug Inc. Aminomethanobenzazocine intermediates. Re. 29,943, Cl. 546-97.000.

Williams, David T., to Board of Regents, State of Florida. Spectrometer system. Re. 29,939, Cl. 356-329.000.

LIST OF PLANT PATENTEES

Bailey, Dorothy J. S., to San Joaquin Rose Co. Rose plant. 4,396, 3-20-79, Cl. 15.000.

Bailey, Dorothy J. S., to San Joaquin Rose Co. Rose plant. 4,397, 3-20-79, Cl. 19.000.

Merrill, Grant, deceased; and by Merrill, Lucile B., executrix. Peach tree. 4,398, 3-20-79, Cl. 43.000.

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Merrill, Lucile B., executrix: *See*—
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Bogaert, Henri M. J. Kite string reel. 251,356, 3-20-79, Cl. D8-358.000.

Brodmann, Harry. Music center stand. 251,376, 3-20-79, Cl. D14-38.000.

Burns, John E.; and Van Lith, Martin J., to Alfred Hospital. Restraint for restricting the movement of persons. 251,388, 3-20-79, Cl. D24-99.000.

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Chase, J. Burrell. Stove. 251,384, 3-20-79, Cl. D23-97.000.

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Getgey, William F. Visor cap. 251,336, 3-20-79, Cl. D2-247.000.
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Zimmer, Ernest C. Fireplace stove. 251,385, 3-20-79, Cl. D23-97.000.

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48 4,144,795
61 4,144,796

CLASS 89

41 M 4,144,797

CLASS 91

488 4,144,798
4,144,799

CLASS 93

49 R 4,144,800

CLASS 96

1 PC 4,145,214
1 PE 4,145,215
28 4,145,216
29 D Re.29,942
53 4,145,217
66.3 4,145,218
74 4,145,219
84 A 4,145,220
95 4,145,221
115 P 4,145,222

CLASS 98

1.5 4,144,801
2.18 4,144,803
119 4,144,802

CLASS 99

452 4,144,804
568 4,144,805

CLASS 100

100 4,144,806
118 4,144,807

CLASS 101

1 4,144,808
288 4,144,809
292 4,144,810
349 4,144,811
382 R 4,144,812
4,144,813

CLASS 102

28 R 4,144,814
214 4,144,815
251 4,144,816

CLASS 104

108 4,144,817
172 B 4,144,818

CLASS 105

230 4,144,819
368 R 4,144,820
465 4,144,821

CLASS 106

36 4,145,223
73.3 4,145,224
154 R 4,145,225
287.24 4,145,226
288 B 4,145,227
304 4,145,228
4,145,229

CLASS 108

129 4,144,822

CLASS 110

214 4,144,824

CLASS 112

121.29 4,144,825
158 E 4,144,826
4,144,827
210 4,144,828

CLASS 114

74 R 4,144,829
204 4,144,830
230 4,144,831

CLASS 116

22 A 4,144,832
28 PR 4,144,833
219 4,144,834

CLASS 118

5 4,144,835
7 4,144,836
4,144,837
125 4,144,838
658 4,144,839

CLASS 119

3 4,144,840
5 4,144,841
52 R 4,144,842
121 4,144,843
133 4,144,844
160 4,144,845

CLASS 122

479 R 4,144,846

CLASS 123

32 EE 4,144,847
32 L 4,144,848
41.54 4,144,849
52 M 4,144,850
78 C 4,144,851
97 B 4,144,852
117 R 4,144,853
4,144,854
119 A 4,144,856
119 EC 4,144,855
122 D 4,144,857
139 AW 4,144,858
148 C 4,144,860
148 CC 4,144,859
179 G 4,144,861
196 S 4,144,862
198 F 4,144,863
4,144,864
241 4,144,865
4,144,866

CLASS 125

14 4,144,867
41 4,144,868

CLASS 126

19 M 4,144,869
41 E 4,144,870
270 4,144,871
4,144,872
271 4,144,873
4,144,874
4,144,875

CLASS 127

60 4,145,230

CLASS 128

1 R 4,144,876
2 S 4,144,877
2.05 A 4,144,879
2.05 V 4,144,878
2.08 4,144,883
71 4,144,880
80 R 4,144,881
172.1 4,144,882
214.4 4,144,884
218 P 4,144,885
284 4,144,886
287 4,144,887
303.1 4,144,888
418 4,144,889
4,144,890
419 P 4,144,891
419 PT 4,144,892
423 R 4,144,893
484 4,144,912

CLASS 131

17 AC 4,144,894
143 4,144,895
149 4,144,896

CLASS 132

9 4,144,897

CLASS 134

4,145,231
113 4,144,898

CLASS 135

1 R 4,144,899
20 A 4,144,900

CLASS 137

240 4,144,901
246.22 4,144,902
624.11 4,144,903
625.3 4,144,904
625.66 4,144,905
819 4,144,906

CLASS 138

39 4,144,907
93 4,144,908
94 4,144,909

CLASS 139

91 4,144,910
383 A 4,144,911

CLASS 141

2 4,144,913
11 4,144,914
18 4,144,915
105 4,144,916
311 R 4,144,917

CLASS 144

3 D 4,144,918

CLASS 145

61 R 4,144,919

CLASS 148

1.5 4,145,233
6.27 4,145,234
12 C 4,145,235
16.5 4,145,232

CLASS 152

233 4,144,920
353 R 4,144,921
410 4,144,922

CLASS 156

73.1 4,145,236
107 4,145,237
132 4,145,238
212 4,145,239
230 4,145,240
305 4,145,241
316 4,145,242
392 4,145,243
541 4,145,244

CLASS 157

13 4,144,923

CLASS 159

13 B 4,145,245

CLASS 160

231 A 4,144,924

CLASS 162

23 4,145,246
136 4,145,247
168 R 4,145,248
210 4,145,249

CLASS 164

7 4,144,925
87 4,144,926
108 4,144,927
418 4,144,928

CLASS 165

8 4,144,929
12 4,144,930
48 S 4,144,931
80 4,144,932
124 4,144,933
134 R 4,144,934

CLASS 166

248 4,144,935
298 4,144,936
314 4,144,937

CLASS 172

59 4,144,938

CLASS 173

49 4,144,939

CLASS 174

28 4,145,565
65 R 4,145,566
107 4,145,567

CLASS 175

5 4,144,940
19 4,144,941
286 4,144,942

CLASS 176

3 4,145,250
19 R 4,145,251

CLASS 177

210 FP 4,144,943

CLASS 178

22 4,145,568
4,145,569
30 4,145,570

CLASS 179

1 E 4,145,571
2 BC 4,145,572
15 A 4,145,574
15 BS 4,145,573
15 FD 4,145,575
16 EC 4,145,576
18 HB 4,145,577
27 D 4,145,578
81 R 4,145,579
84 VF 4,145,580
90 BB 4,145,581
100.41 K 4,145,582
146 R 4,145,583

CLASS 180

6.2 4,144,944
19 R 4,144,945
89.15 Re.29,938
132 4,144,946
4,144,947
148 4,144,948

CLASS 181

106 4,144,949

CLASS 184

6.11 4,144,950

CLASS 188

32 4,144,951
73.3 4,144,952
134 4,144,953
165 4,144,954

CLASS 192

0.096 4,144,956
52 4,144,955
98 4,144,957
105 F 4,144,958
106.2 4,144,959

CLASS 195

1.3 4,145,252
81 4,145,254
96 4,145,253
103.5 R 4,145,255

CLASS 198

339 4,144,960
472 4,144,961
641 4,144,962
750 4,144,963
830 4,144,964
831 4,144,965

CLASS 200

5 A 4,145,584
11 DA 4,145,585
67 DA 4,145,587
67 G 4,145,586
83 P 4,145,588
159 R 4,145,589
330 4,145,590

CLASS 201

25 4,145,256

CLASS 202

241 4,145,257
248 4,145,258
4,145,259

CLASS 203

14 4,145,260

CLASS 204

14 N 4,145,261
15 4,145,262
35 R 4,145,263
59 R 4,145,264
98 4,145,265
131 4,145,266
140 4,145,267
149 4,145,268
157.1 H 4,145,269
180 P 4,145,271
180 R 4,145,270
195 S 4,145,272

CLASS 206

188 4,144,966
229 4,144,967
509 4,144,968

CLASS 208

3 4,145,273
8 4,145,274
33 4,145,275
57 4,145,276
212 4,145,277

CLASS 209

166 4,144,969
542 4,144,970

CLASS 210

10 4,145,278
17 4,145,279
20 4,145,280
37 B 4,145,281
46 4,145,282
63 R 4,145,283
75 4,145,284
100 4,145,285
104 4,145,286
4,145,287
111 4,145,288
169 4,145,289
232 4,145,291
242 R 4,145,292
242 S 4,145,290
321 A 4,145,293
419 4,145,294
500 M 4,145,295

CLASS 211

64 4,144,971
113 4,144,972

CLASS 212

8 R 4,144,973
18 4,144,974

CLASS 215

216 4,144,983

CLASS 219

10.49 R 4,145,591
4,145,592
60 A 4,145,593
61 4,145,594
75 4,145,595
98 4,145,596
121 EB 4,145,597
137 R 4,145,598
216 4,145,599
222 4,145,600
298 4,145,601
370 4,145,602
387 4,145,603
439 4,145,604

CLASS 220

1.5 4,144,984
254 4,144,985

CLASS 222

52 4,144,986
321 4,144,987
390 4,144,988
438 4,144,989

CLASS 226

154 4,144,990
195 4,144,991

CLASS 228

102 4,144,992
107 4,144,993

CLASS 229

5.6 4,144,994
15 4,144,995
33 4,144,996

CLASS 235

92 DN 4,145,605
477 4,145,606

CLASS 236

15 BF 4,144,997
48 R 4,144,998

CLASS 237

1 A 4,144,999

CLASS 239

14 4,145,000
56 4,145,001
110 4,145,002
288 4,145,003
499 4,145,004
573 4,145,005

CLASS 241

24 4,145,007
46.17 4,145,008
194 4,145,009

CLASS 242

18 A 4,145,010
71.6 4,145,011
74 4,145,012
74.1 4,145,013
83 4,145,014
84.2 A 4,145,015
193 4,145,016

CLASS 244

3.25 4,145,017

CLASS 246

34 R 4,145,018

CLASS 248

161 4,145,020
371 4,145,021
453 4,145,022
479 4,145,023

CLASS 249

35 4,145,024

CLASS 250

199 4,145,607
231 SE 4,145,608
361 R 4,145,609
367 4,145,610
439 P 4,145,611
439 R 4,145,612
445 T 4,145,613
4,145,614
492 A 4,145,615
505 4,145,616

CLASS 251

63 4,145,025
80 4,145,026

CLASS 252

8.1 4,145,296
25 4,145,297
51.5 A 4,145,298
62.1 L 4,145,299
62.1 P 4,145,300
62.56 4,145,301
91 4,145,302
156 4,145,303
182 4,145,304
186 4,145,305
187 H 4,145,306
309 4,145,307
321 4,145,308
358 4,145,309
4,145,310
415 4,145,311
429 B 4,145,312
4,145,313
437 4,145,314
455 Z 4,145,315
465 4,145,316
512 4,145,317

CLASS 254

156 4,145,027
186 R 4,145,028
188 4,145,029

CLASS 256

1 4,145,030
65 4,145,031
73 4,145,032

CLASS 260

22 CB 4,145,319
23 AR 4,145,320
27 BB 4,145,321
28.5 AS 4,145,322
29.3 4,145,323
29.4 R 4,145,324
29.6 F 4,145,325
4,145,326
29.6 MN 4,145,327
30.4 R 4,145,328
4,145,329
33.6 UA 4,145,338
37 R 4,145,330
40 R 4,145,331
42.52 4,145,332
45.8 N 4,145,333
112 R 4,145,336
112.5 S 4,145,337
148 4,145,339
153 4,145,340
154 4,145,341
207 4,145,342
239.1 4,145,343
239.3 B 4,145,344
239.3 T 4,145,345
239.55 C 4,145,346
301 4,145,349
308 D 4,145,350
326 N 4,145,351
326.82 4,145,352
346.7 4,145,353
347.2 4,145,354
348.34 4,145,355
360 4,145,356
397.2 4,145,357
439 R 4,145,358
448.2 N 4,145,359
453 P 4,145,360
463 4,145,361
465 G 4,145,362
553 A 4,145,363
578 4,145,364
586 R 4,145,365
601 R 4,145,366
652 P 4,145,367
653 4,145,368
831 4,145,369
835 4,145,370
856 4,145,371
857 PE 4,145,372
873 4,145,373
4,145,374
874 4,145,375
876 B 4,145,376
4,145,377
876 R 4,145,378
879 4,145,379
4,145,380
880 R 4,145,381
987 4,145,382

CLASS 261

29 4,145,383
35 4,145,384

CLASS 264

22 4,145,385
4,145,386
23 4,145,387
24 4,145,388
40.7 4,145,389
69 4,145,390
83 4,145,391
513 4,145,392

CLASS 266

44 4,145,033

CLASS 267

8 R 4,145,036
121 4,145,019
125 4,145,034

CLASS 269

69 4,145,006

CLASS 270

52.5 4,145,035
58 4,145,037
4,145,038

CLASS 271

233 4,145,041
274 4,145,039
276 4,145,040

CLASS 272

56.5 R 4,145,042

CLASS 273

1 E 4,145,043
1.5 R 4,145,044
55 B 4,145,046
61 C 4,145,045
73 F 4,145,047
95 B 4,145,049
95 R 4,145,048
96 R 4,145,050
97 R 4,145,051
171 4,145,052
176 AB 4,145,053
186 A 4,145,054
187 B 4,145,055

CLASS 274

10 S 4,145,056

CLASS 277

27 4,145,057
62 4,145,058
81 R 4,145,059
139 4,145,060

CLASS 279

96 4,145,061

CLASS 280

11.37 E 4,145,062
4,145,063
87.01 4,145,064
87.04 R 4,145,065
166 4,145,066
276 4,145,067
281 R 4,145,068
303 4,145,069
615 4,145,070
624 4,145,071
668 4,145,072
702 4,145,073
744 4,145,074

CLASS 285

81 4,145,075
94 4,145,076

CLASS 293

102 4,145,077

CLASS 294

67 DA 4,145,078

CLASS 295

21 4,145,079

CLASS 296

183 4,145,080

CLASS 297

159 4,144,823
216 4,145,081
384 4,145,082
4,145,083
418 4,145,084

CLASS 298

5 4,145,085

CLASS 299

15 4,145,086

CLASS 302

14 4,145,087

CLASS 303

2 4,145,088
22 R 4,145,089
37 4,145,090
118 4,145,091

CLASS 305

35 EB 4,145,092

CLASS 307

43 4,145,617
64 4,145,618
118 4,145,619
149 4,145,620
215 4,145,621
270 4,145,622
289 4,145,623
299 R 4,145,624

CLASS 308

3.8 4,145,093
8.2 4,145,094
192 4,145,095

CLASS 310

27 4,145,625
91 4,145,626
344 4,145,627

CLASS 312

7 TV 4,145,096
33 4,145,099
196 4,145,097
257 SM 4,145,098
261 4,145,100

CLASS 313

60 4,145,628
230 4,145,629
273 4,145,630
315 4,145,631
330 4,145,632
422 4,145,633
490 4,145,634

CLASS 315

5.39 4,145,635
101 4,145,636
241 P 4,145,637
323 4,145,638
411 4,145,639

CLASS 316

4 4,145,101

CLASS 318

139 4,145,640
269 4,145,641
331 4,145,642
696 4,145,643
4,145,644
762 4,145,645
782 4,145,646
810 4,145,647

CLASS 320

25 4,145,648

CLASS 323

4 4,145,649
17 4,145,650

CLASS 324

72.5 4,145,651
142 4,145,652
158 MG 4,145,653

CLASS 325

15 4,145,655
25 4,145,656
32 4,145,657
180 4,145,658
468 4,145,659

CLASS 328

138 4,145,660
145 4,145,661
181 4,145,662

CLASS 329

50 4,145,663

CLASS 330

85 4,145,664
254 4,145,665
265 4,145,666

CLASS 331

16 4,145,667
94.5 P 4,145,668
94.5 PE 4,145,669
135 4,145,670

CLASS 332

7.51 4,145,671

CLASS 333

1.1 4,145,672
135 4,145,673
165 4,145,675
4,145,676
181 4,145,674

CLASS 335

212 4,145,677
214 4,145,678

CLASS 336

57 4,145,679

CLASS 337

407 4,145,654

CLASS 339

14 P 4,145,102
65 4,145,104
75 M 4,144,648

75 P 4,145,105
99 R 4,145,103
143 S 4,145,106
263 R 4,145,107

CLASS 340

5 MP 4,145,680
51 4,145,681
52 H 4,145,682
146.1 F 4,145,683
311 4,145,684
347 AD 4,145,689
347 DD 4,145,686
365 S 4,145,687
391 4,145,688
782 4,145,685

CLASS 343

6.5 R 4,145,690
7 AG 4,145,691
17.7 4,145,692
722 4,145,693
727 4,145,694
779 4,145,695
792.5 4,145,696

CLASS 346

35 4,145,697
139 R 4,145,698

CLASS 350

96.14 4,145,109
96.15 4,145,110
97 4,145,111
103 4,145,112
166 4,145,113
175 E 4,145,108
184 4,145,115
214 4,145,116
4,145,117
241 4,145,118
301 4,145,119
332 4,145,120
349 4,145,114
355 4,145,121

CLASS 351

7 4,145,122
24 4,145,123
121 4,145,124
165 4,145,125

CLASS 352

74 4,145,126
79 4,145,127

CLASS 354

21 4,145,128
23 D 4,145,129
51 4,145,130
115 4,145,131
249 4,145,132
275 4,145,133
295 4,145,134
317 4,145,135

CLASS 355

8 4,145,136
15 4,145,137
25 4,145,138

CLASS 356

73 4,145,139
123 4,145,141
229 4,145,142
329 Re.29,939
360 4,145,140

CLASS 357

5 4,145,699
23 4,145,700
45 4,145,701
4,145,702
55 4,145,703
68 4,145,707
82 4,145,708

CLASS 358

6 4,145,709
7 4,145,710
8 4,145,704
4,145,705
10 4,145,706
14 4,145,711
60 4,145,712
92 4,145,713
106 4,145,714
108 4,145,715
118 4,145,716
121 4,145,717
128 4,145,718
183 4,145,719
194 4,145,720
213 4,145,721
223 4,145,722

CLASS 360

79 4,145,723
92 4,145,724
106 4,145,725
133 4,145,726
137 4,145,727

CLASS 361

23 4,145,728
119 4,145,729

CLASS 362

10 4,145,730
123 4,145,731

CLASS 364

109 4,145,732
200 4,145,733
4,145,734
4,145,735
4,145,736
4,145,737
4,145,738
4,145,739
4,145,745
469 4,145,740
551 4,145,746
554 4,145,744
571 4,145,741
605 4,145,743
709 4,145,742
4,145,752
724 4,145,747
862 4,145,748
900 4,145,749
4,145,751
4,145,753
4,145,754
4,145,755
4,145,756

CLASS 365

6 4,145,750
17 4,145,757
200 4,145,758
203 4,145,759
226 4,145,760
227 4,145,761

CLASS 366

40 4,145,143
287 4,145,144

CLASS 400

124 4,145,145
614 4,145,146

CLASS 401

175 4,145,147
209 4,145,148

CLASS 403

217 4,145,149
295 4,145,150

CLASS 404

25 4,145,151
71 4,145,152
73 4,145,153
81 4,145,154
98 4,145,155
113 4,145,156

CLASS 405

43 4,145,157
208 4,145,158

CLASS 407

53 4,145,159

CLASS 408

103 4,145,160

CLASS 414

42 4,144,976
57 4,144,977
537 4,144,979
544 4,144,978
607 4,144,981
666 4,144,982
725 4,144,980
736 4,144,975

CLASS 417

22 4,145,161
48 4,145,162
222 4,145,163
252 4,145,164
418 4,145,165
519 4,145,166

CLASS 418

61 B 4,145,167
150 4,145,168

CLASS 422

7 4,145,393
179 4,145,394
232 4,145,187

CLASS 423

1 4,145,395
22 4,145,396
54 4,145,397
121 4,145,398
235 4,145,399
419 P 4,145,400
478 4,145,401
579 4,145,402
613 4,145,403
635 4,145,404
657 4,145,405

CLASS 424

1 4,145,406
4,145,407
16 4,145,408
4,145,409
19 4,145,410
45 4,145,411
58 4,145,412
63 4,145,413
180 4,145,414
195 4,145,415
238 4,145,416
244 4,145,417
246 4,145,418
248.4 4,145,419
248.5 4,145,420
250 4,145,421
4,145,422
251 4,145,423
256 4,145,424
263 4,145,425
266 4,145,432
267 4,145,426
4,145,427
269 4,145,428
271 4,145,429
272 4,145,430
273 B 4,145,431
4,145,433
273 R 4,145,436
274 4,145,434
4,145,435
279 4,145,437
283 4,145,438
285 4,145,439
287 4,145,440
309 4,145,441
324 4,145,443
330 4,145,442
331 4,145,444

CLASS 425

11 4,145,169
78 4,145,174
101 4,145,170
110 4,145,171
222 4,145,172
224 4,145,173
377 4,145,175
405 R 4,145,176
445 4,145,177
504 Re.29,940

CLASS 426

60 4,145,445
69 4,145,446
72 4,145,447
4,145,448
120 4,145,449
231 4,145,450
321 4,145,451
4,145,452
516 4,145,453
565 4,145,454
614 4,145,455

CLASS 427

38 4,145,456
4,145,457
39 4,145,458
88 4,145,459
97 4,145,460
155 4,145,461
160 4,145,462
337 4,145,463

CLASS 428

31 4,145,465
35 4,145,466
91 4,145,467
171 4,145,464
239 4,145,468
245 4,145,469
336 4,145,470
366 4,145,471
367 4,145,472
373 4,145,473
379 4,145,474
389 4,145,475
441 4,145,477
481 4,145,478
500 4,145,479
513 4,145,480
678 4,145,481

CLASS 429

27 4,145,482
103 4,145,483
105 4,145,484
152 4,145,485

CLASS 431

11 4,145,178
29 4,145,179
46 4,145,180

CLASS 432

60 4,145,181

CLASS 521

31 4,145,486
112 4,145,318
117 4,145,487
177 4,145,488

CLASS 526

1 4,145,489
19 4,145,490
31 4,145,491
47.3 4,145,492
58 4,145,493
62 4,145,496
81 4,145,494
93 4,145,495
164 4,145,497
178 4,145,498
201 4,145,499
204 4,145,500
217 4,145,501
255 4,145,502
282 4,145,503

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